SHARP Service Manual

MODELS

SC-103H

CP-108H

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SHARP CORPORATION OSAKA, JAPAN

ELECTRICAL SPECIFICATIONS

Circuit:	FM/AM 2-band superheterodyne system stereo tuner-amplifier with FM multiplex circuit with AFC and 4 track cassette tape recorder and 2 way speaker system
Semiconductors:	31-transistor. 1-FET. 1-IC. 15-diode
Power Source:	110/220/240V, 50Hz
Power Consumption:	60 watts
Speakers:	Woofer 6-1/2" x 2 Tweeter 1-5/8" x 2
Dimensions: (SC103H)	20-3/4"(W)x10-1/2"(D)x5-1/4"(H)
(CP-108H)	9-3/4"(W)x5-1/2"(D)x13-11/16"(H)
Weight:	(SC103H) 15.2lbs (CP-108H) 4.2lbs x 2

FM SECTION

Frequency Coverage:	88 – 106MHz
Maximum Sensitivity:	1.6μV
IF Rejection:	70 dB
Image Rejection:	48 dB
Frequency Response:	70 – 10kHz
Harmonic Distortion:	1%
Signal to Noise Ratio:	45 dB

FM STEREO SECTION

Stereo Separation:	35 dB
Stereo Indicator Lighting Level:	10μV
Harmonic Distortion:	1%
Signal to Noise Ratio:	45 dB

AM SECTION

Frequency Coverage:	520 – 1,620kHz
Maximum Sensitivity:	130μV/m
IF Rejection:	30 dB
Image Rejection:	40 dB
AGC Figure of Merit:	50 dB
Band Width:	5.5kHz
Harmonic Distortion:	2%

AUDIO SECTION

Total Peak Music-Power Output:	20W	
Distortion at 500mW:	0.5%	
Frequency Response:	40Hz ~ 22kHz	
Hum and Noise Level:	Residual Volume	3mV
	Maximum Volume Phono MM	60mV
	Tape	60mV
Sensitivity for Rated Output:	Phono M.M.	1mV
Channel Separation:	50 dB	
Tone Characteristics:	Bass Boost at 100Hz	+ 8 dB
	Cut at 100Hz	-11 dB
	Treble Boost at 10kHz	+ 8 dB
	Cut at 10kHz	-15 dB

TAPE RECORDER SECTION

Type:	4-track 2-channel stereo cassette tape recorder
Tape:	Philips type compact cassette tape
Tape Speed:	1-7/8 ips
Record/Playback Time:	60 minutes (C-60)
Recording System:	AC bias 53.5kHz
Erasing System:	AC erasing
Wow & Flutter:	0.45% weighted peak
Fast Forward & Rewind Time:	70 seconds (C-60)
Frequency Response:	40Hz to 12,000Hz
Distortion:	1.6%
Signal to Noise Ratio:	46 dB
Channel Separation:	35 dB
Erase Ratio:	65 dB
Input Circuitry:	MIC x 2(microphone impedance 500Ω) DIN-TYPE
Sensitivity & Input Impedance:	
MIC	0.1mV, @47KΩ impedance
Line	50mV, @220KΩ impedance

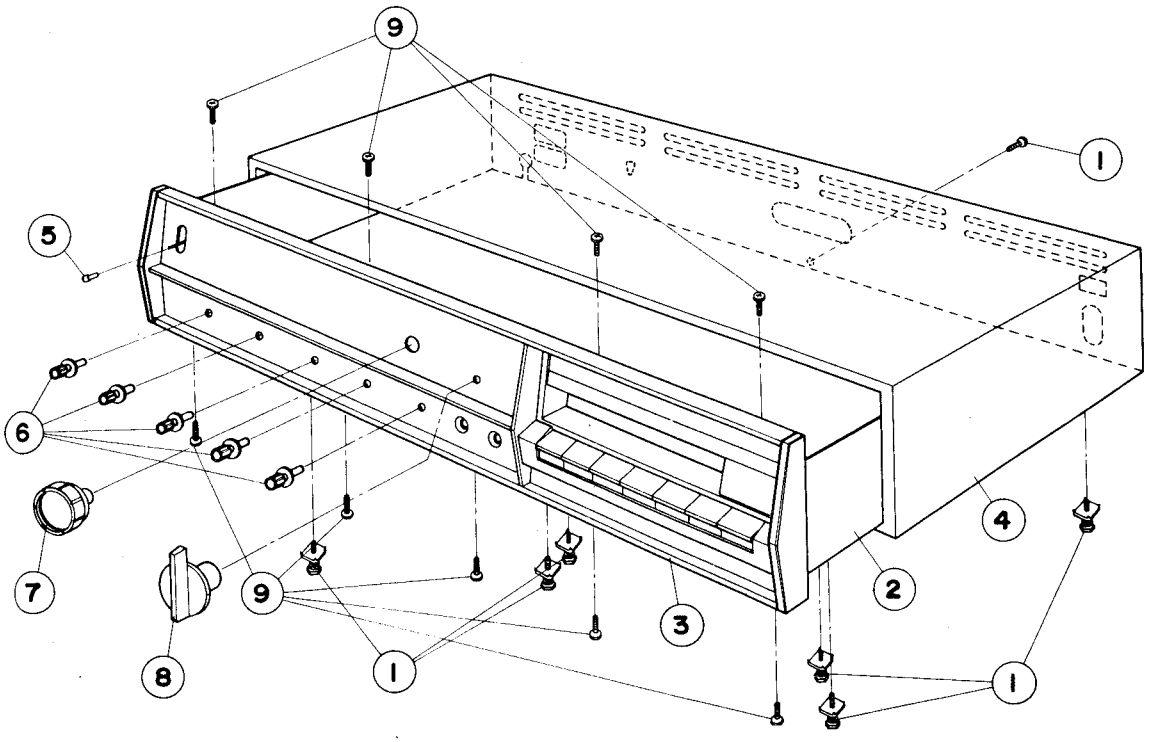


Figure 1 DISASSEMBLY

DISASSEMBLY

CHASSIS REMOVAL (Refer to Figure 1)

1. Disconnect all leads connected to the back of the set.
2. Remove 7 screws (1) retaining the chassis (2).
3. Gently pull forward the panel (3) and chassis from the cabinet (4).

FRONT PANEL REMOVAL

1. Remove the cabinet as described in Chassis Removal.
2. Remove 8 knobs (5,6,7,8) from front of the panel.
3. Remove 9 screws (9) retaining the front panel.
4. Gently pull out the panel while holding both sides.

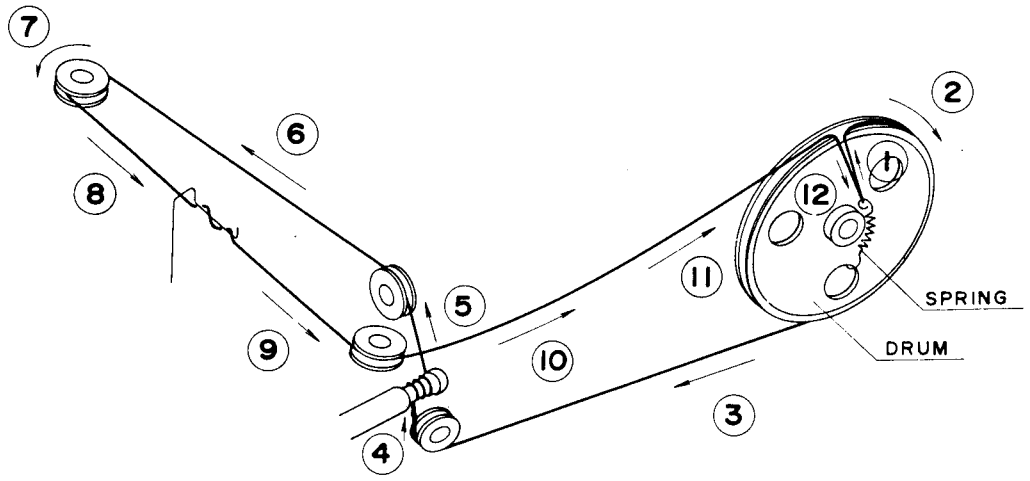


Figure 2 DIAL CORD STRINGING

OPERATING MODES

1. STOP Mode

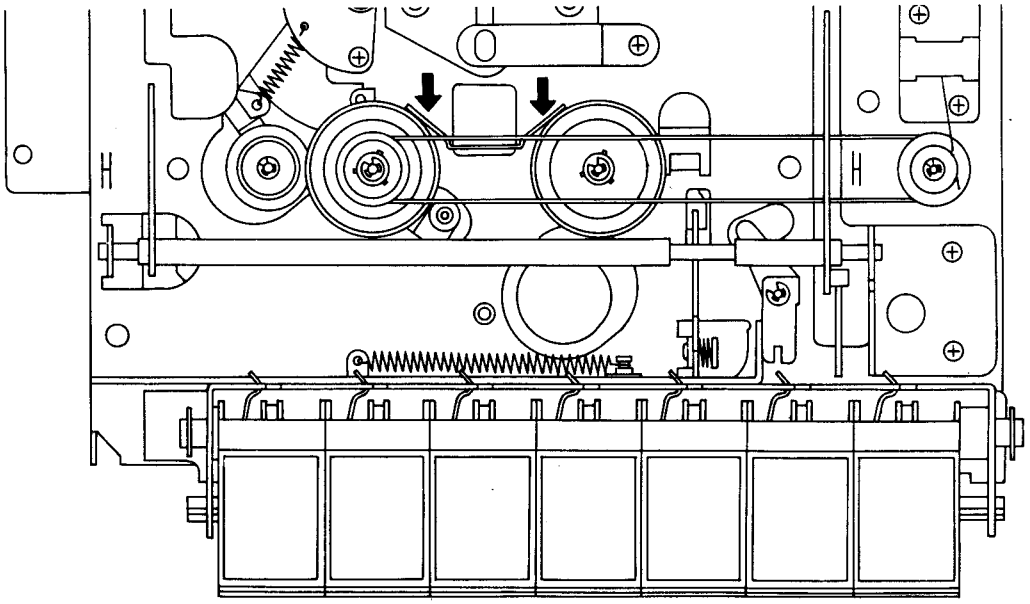


Figure 3

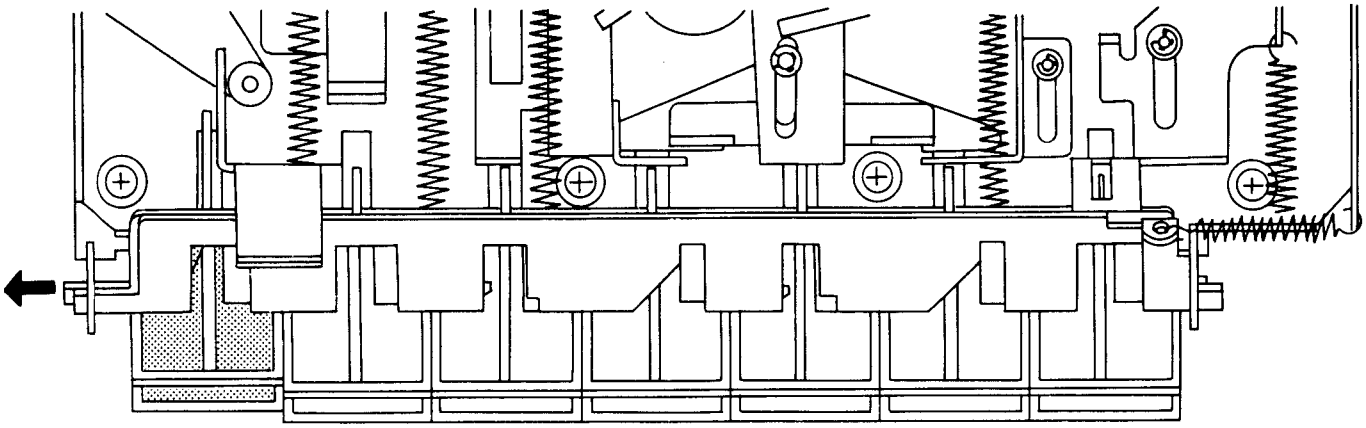


Figure 4

2. EJECT Mode

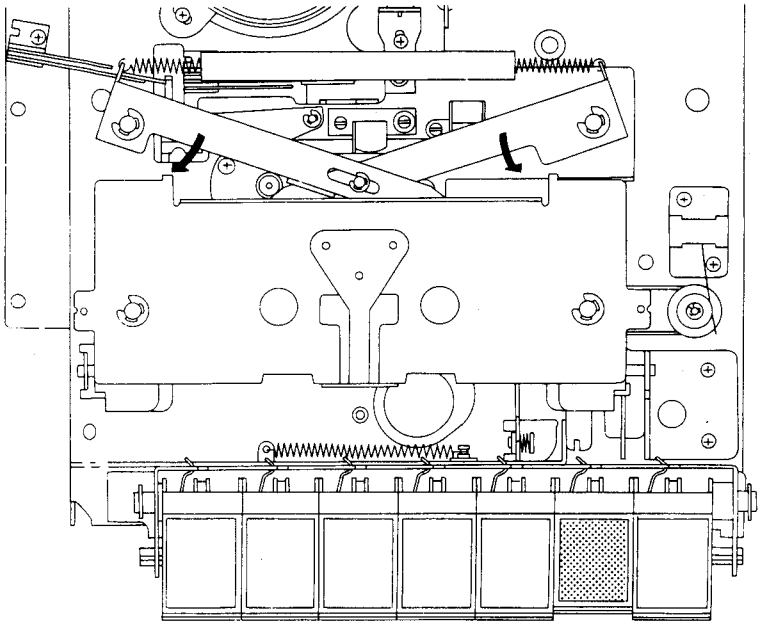


Figure 5

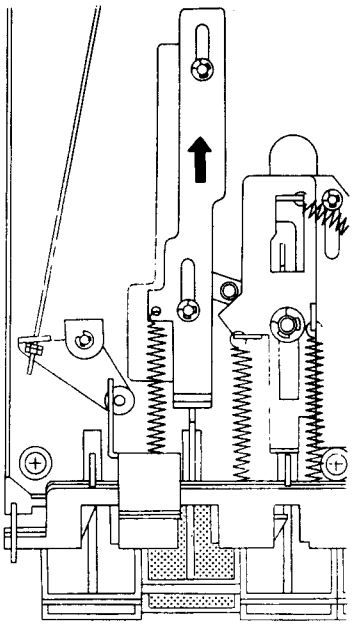


Figure 6

3. RECORD Mode

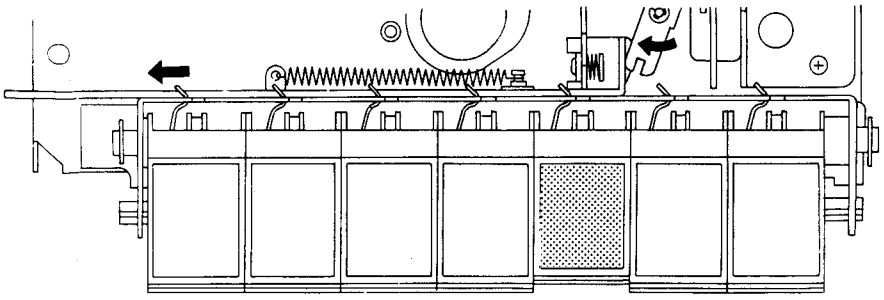


Figure 7

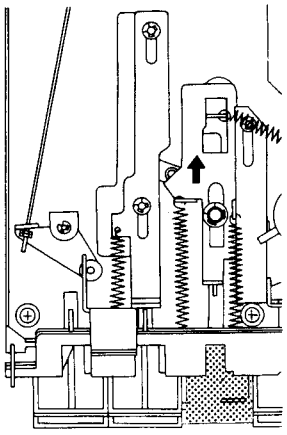


Figure 8

4. REWIND Mode

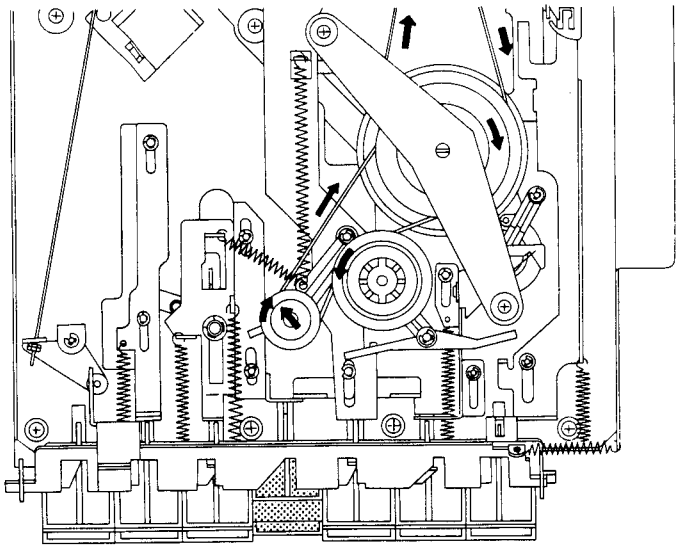


Figure 9

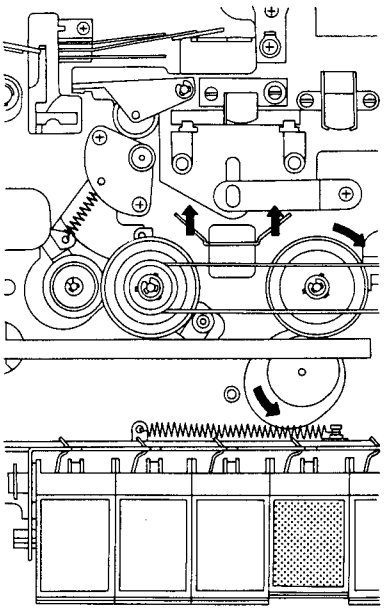


Figure 10

5. PLAY Mode

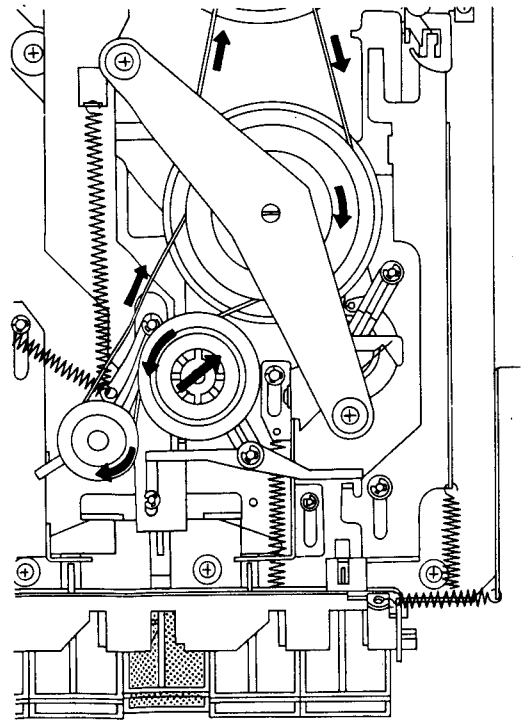


Figure 11

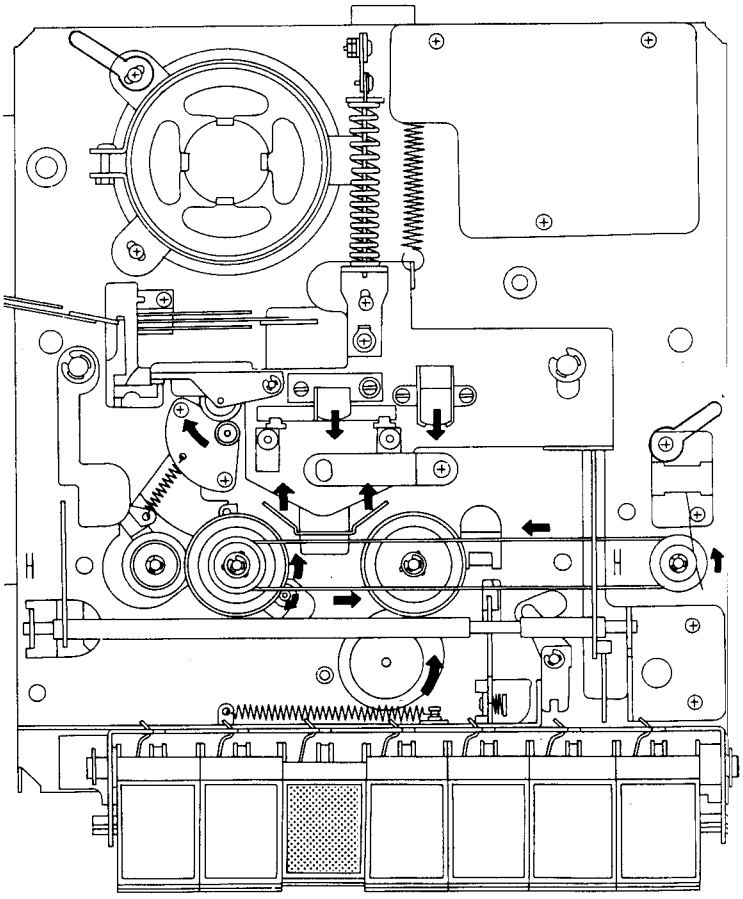


Figure 12

6. FAST FWD Mode

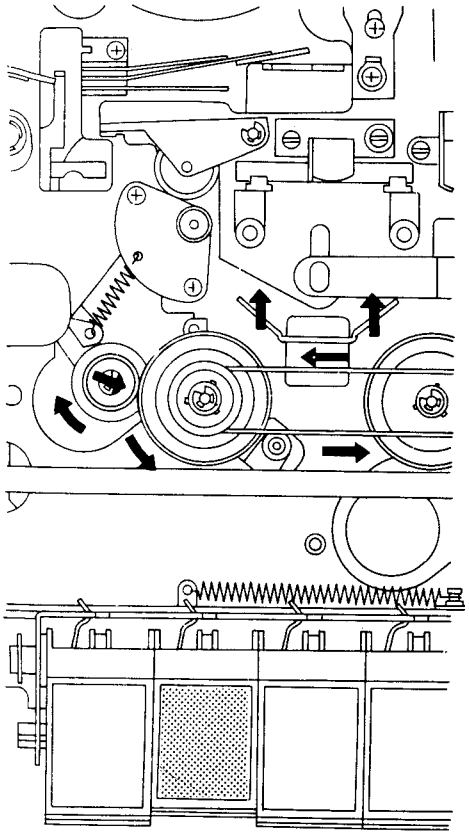


Figure 13

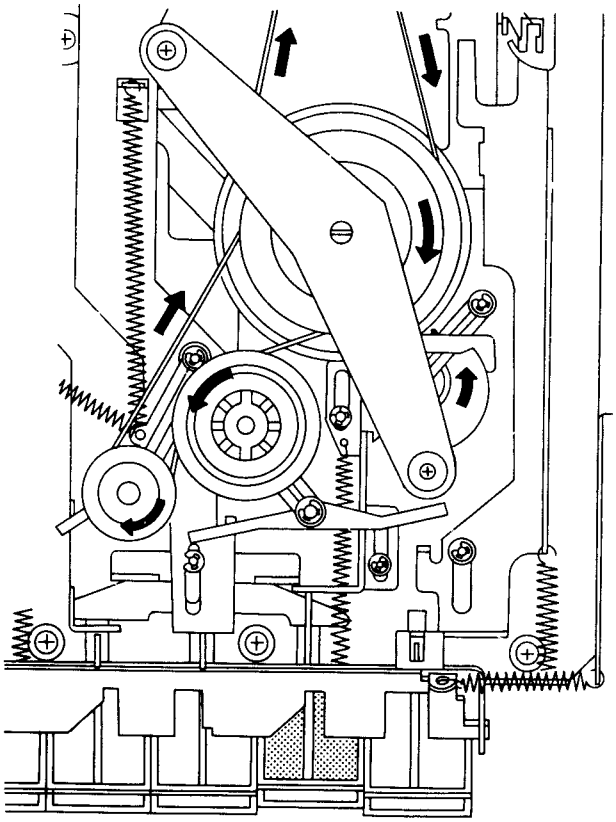


Figure 14

7. PAUSE Mode

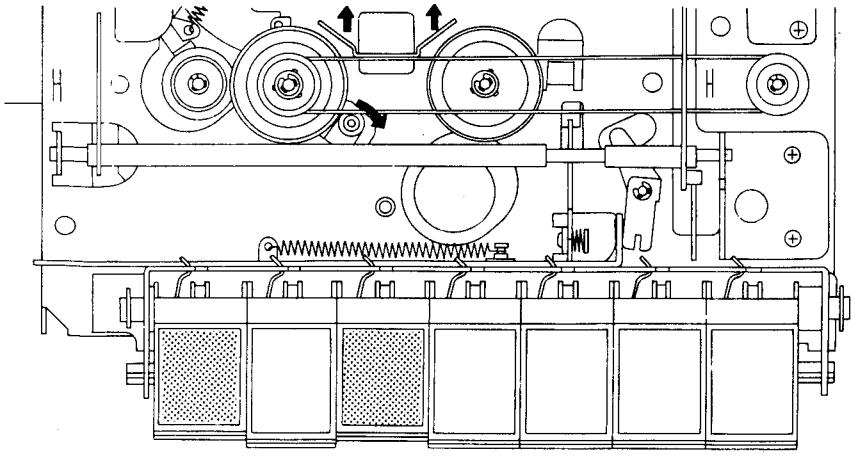


Figure 15

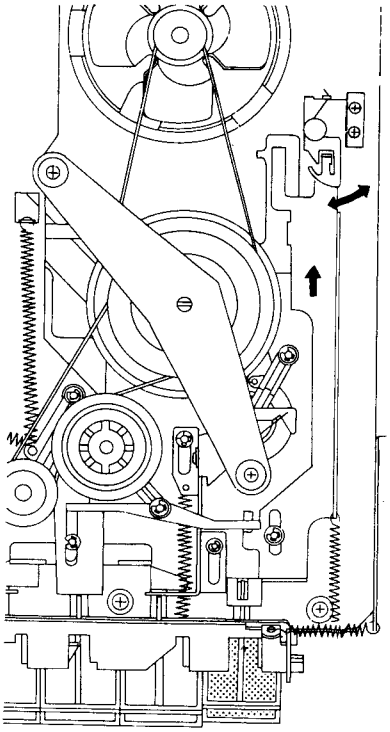


Figure 16

MECHANISM ADJUSTMENT

1. AUTOMATIC SHUT-OFF MOTION ADJUSTMENT (Refer to Fig. 17 and Fig. 18)

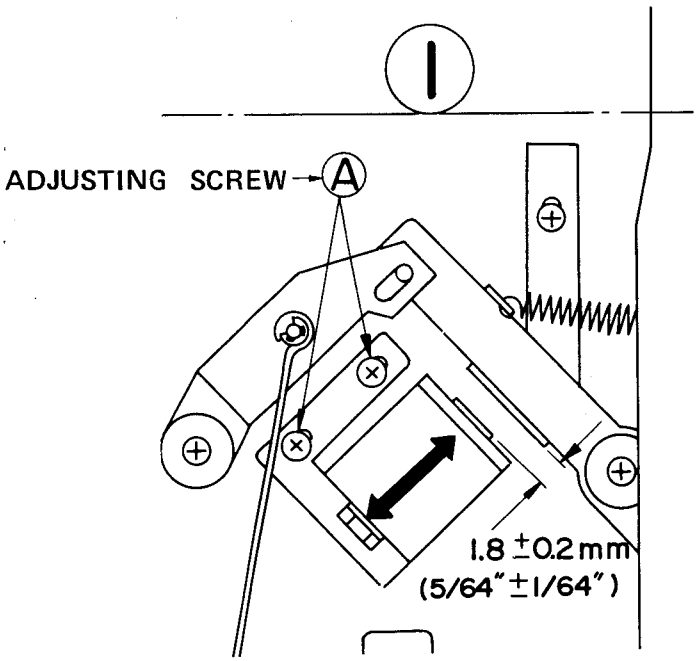


Figure 17

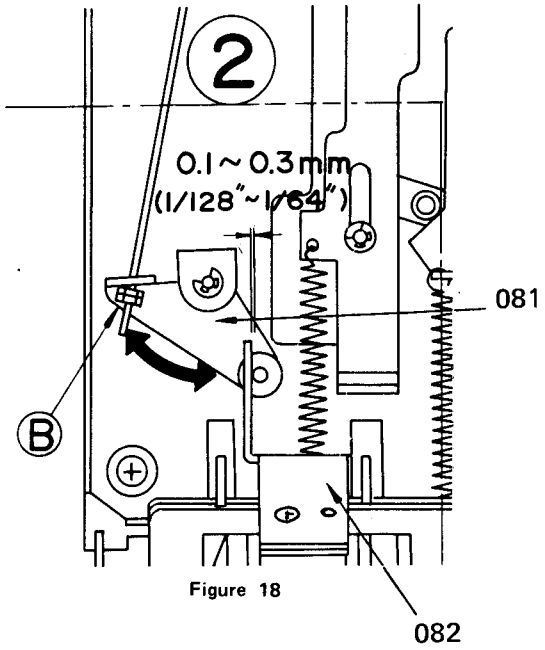


Figure 18

1) Adjust the position of the electromagnet by using a thickness gauge so that a distance becomes approximately 1.8±0.2mm(5/64"±1/64")in STOP mode, as shown in Fig. 17.
2) Adjust the nut so that clearance between STOP lever (081) and (082) becomes 0.1 to 0.3mm (1/128"~1/64").

2. FLYWHEEL THRUST CLEARANCE ADJUSTMENT (Refer to Fig. 19)

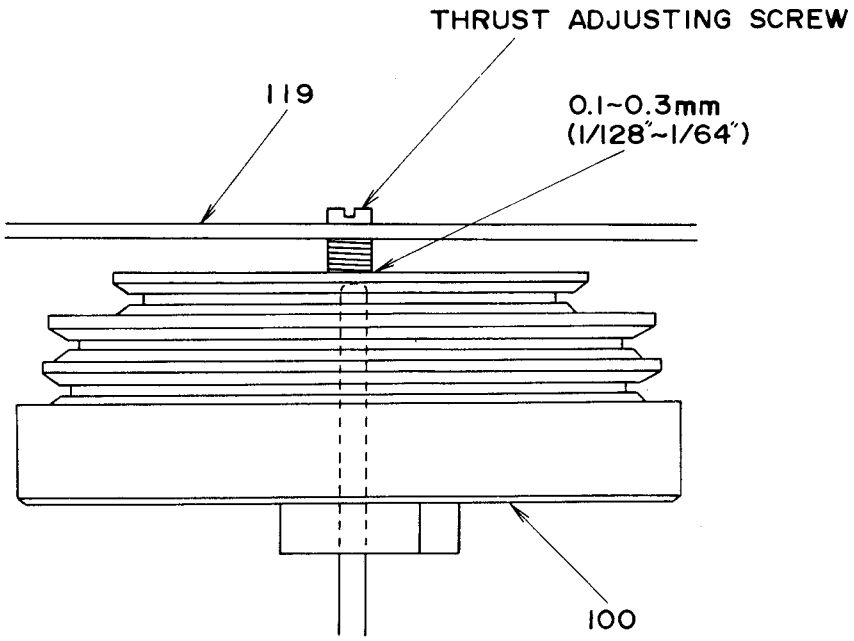


Figure 19

3. MOTOR SWITCH POSITION ADJUSTMENT (Refer to Fig. 20)

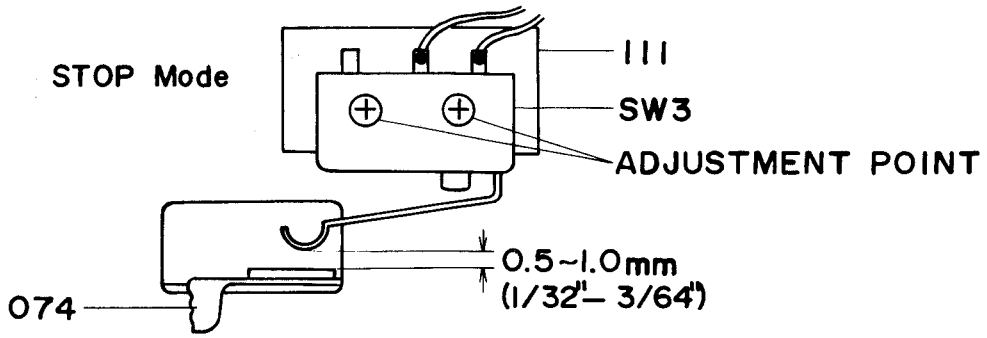


Figure 20

4. PRESSURE ROLLER ADJUSTMENT (Refer to Fig. 21)

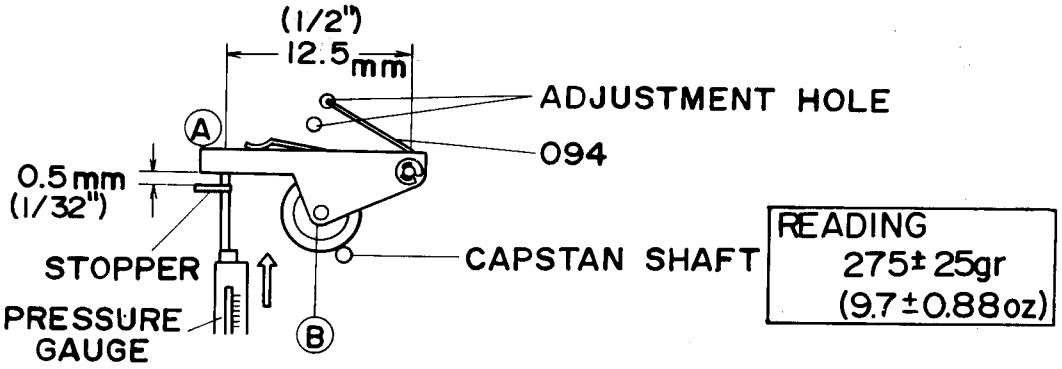


Figure 21

1) Adjust the pressing force of the pressure roller (101) to the capstan shaft in PLAY mode.
2) Read the value of pressing force when the pressure roller (101) moves off the capstan shaft.
3) At the time, in PLAY mode check that clearance between the pressure roller (101) and the stopper is around 0.5mm (1/32").

5. TURNTABLE DRIVING PULLEY PRESSURE ADJUSTMENT (Refer to Fig. 22)

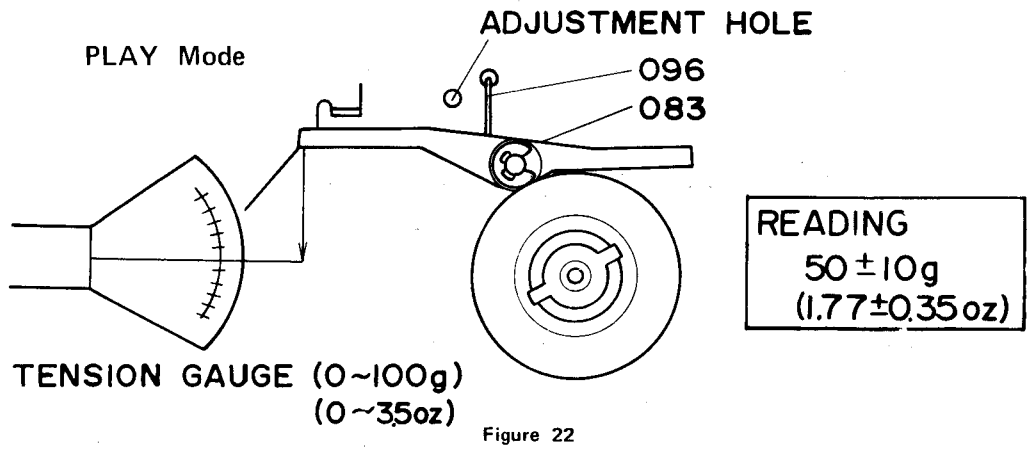


Figure 22

1) Measure the pressing force, hooking a tension gauge on the slip roller lever (083).
2) Read the pressing force when the take-up turntable (108) stops.

6. FAST FWD ROLLER PRESSURE ADJUSTMENT (Refer to Fig. 23)

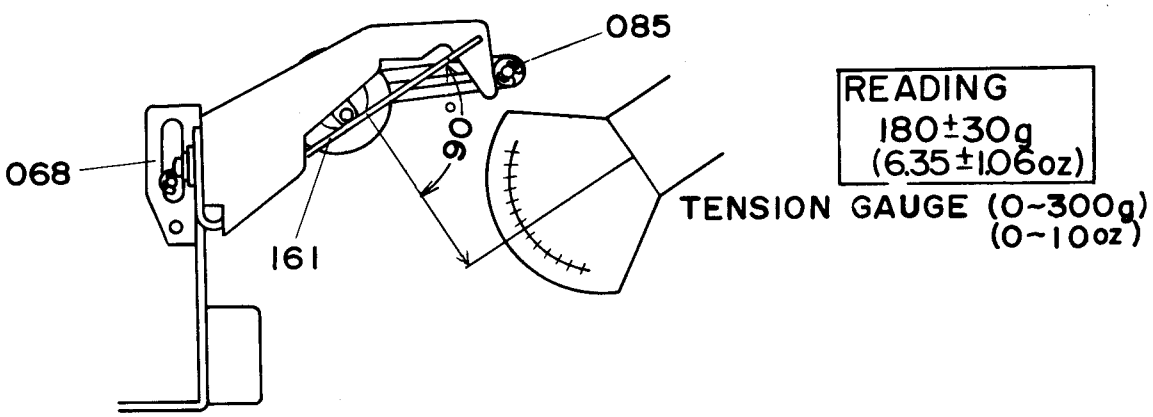


Figure 23

1) Hook a tension gauge on A part of FAST FWD roller (085) in FAST FWD mode and read the tension gauge when the take-up turntable (108) stops. Adjustment is made by bending the spring (161).

7. REWIND ROLLER PRESSURE ADJUSTMENT (Refer to Fig. 24)

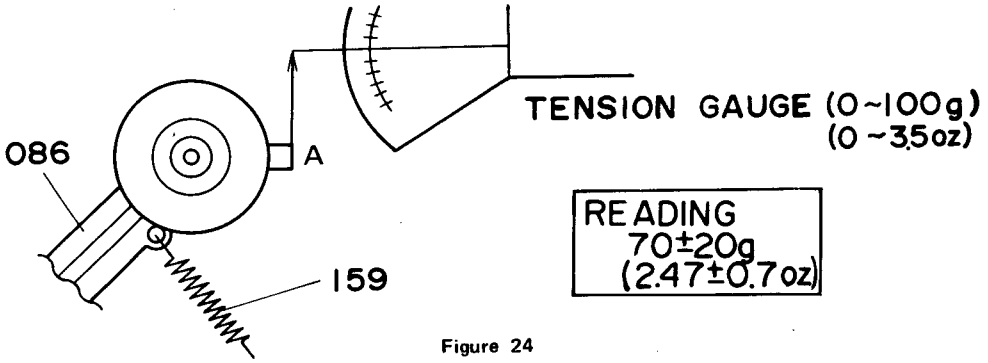


Figure 24

1) Set a tension gauge at A part of the REWIND roller lever (086) in REWIND mode and read the tension gauge when the supply turntable (101) stops.. Adjust the tension by the spring (159).

8. BRAKE LEVER ADJUSTMENT (Refer to Fig. 25)

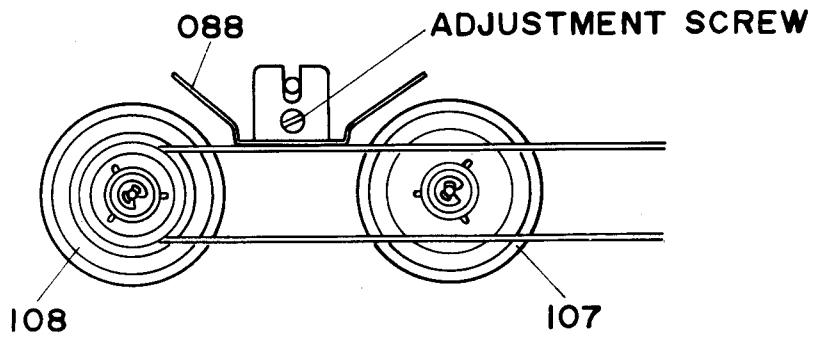


Figure 25

1) Check that the brake lever (088) is pressed against the turntables (107 & 108) in STOP mode and that the brale lever (088) is apart at the same distance from the turntables (107 & 108) in PLAY, FAST FWD and REWIND modes. Adjust it by the retaining screw.

9. SUB-CHASSIS STROKE ADJUSTMENT (Refer to Fig. 26)

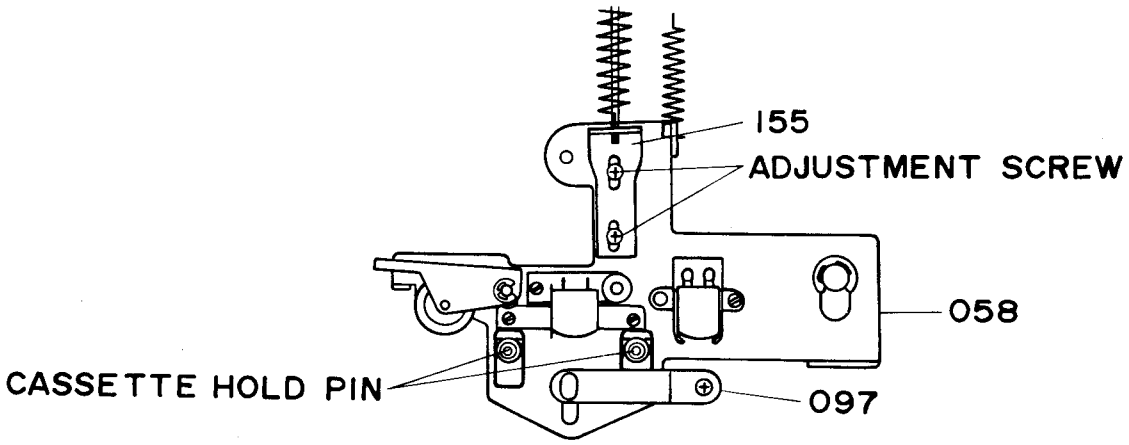


Figure 26

1) Adjust the sub-chassis adjusting bracket (155) so that the long hole of the sub-chassis (058) is pressed against the cassette hold pin in PLAY mode and also in STOP mode.

10. PAUSE MECHANISM ADJUSTMENT (Refer to Fig. 27 and Fig. 28)

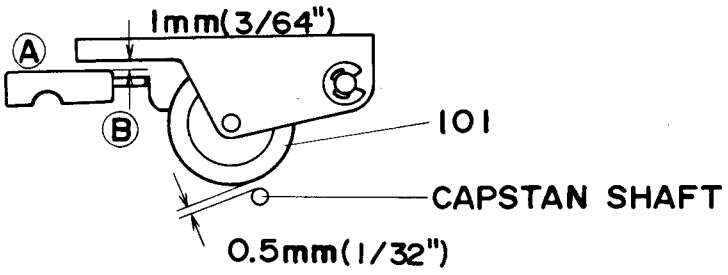


Figure 27

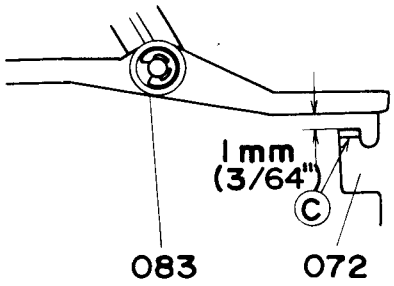


Figure 28

1) Depress the PAUSE button in PLAY mode and check that clearance between the pressure roller (101) and the capstan shaft is over 0.5mm (1/32"). Adjust it by bending A part of the pause operating lever (072).
2) After adjustment, depress only the PAUSE button and, in PLAY mode, check that clearance between the pressure roller lever (101) and B part of the pause operating lever (072) is over 1mm (3/64").
3) Adjust it by bending C part so that the take-up turntable (128) and the pressure roller (101) simultaneously stop when PAUSE button is depressed in PLAY mode.
4) Disengage PAUSE button and check that clearance at C part is over 1mm (3/64") in PLAY mode.

11. TRANSPORT POWER SWITCH (SW-5 SW-6) ADJUSTMENT (Refer to Fig. 29)

1) For SW-5, check that A and B are in contact with each other but C is apart in STOP mode and that A and C are in contact but B is apart in PLAY, FAST FWD, REWIND modes.
2) For SW-6, check that D and E are in contact with each other in PAUSE mode and apart when PAUSE button is disengaged.
3) Adjust it by the retaining screw.

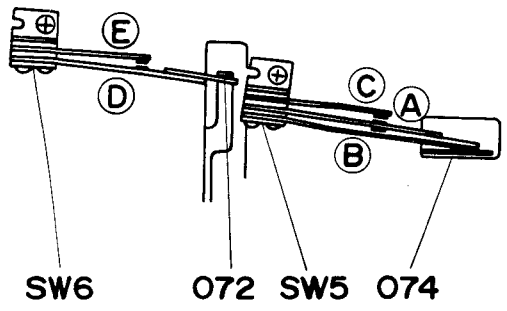


Figure 29

12. TORQUE CHECK (Refer to Fig. 30)

	TORQUE
PLAY mode	45±15g·cm (6.47±2.15oz·inch)
FAST FWD mode	80±20g·cm (11.5±2.87 oz·inch)
REWIND mode	100±20g·cm (14.4±2.87 oz·inch)

Stop the motion of the revolving turntable by tightening Dial Torque Gauge, and then loosen the Gauge gradually in the direction of turntable revolution.
Read the gauge value when the turntable has begun rotating.

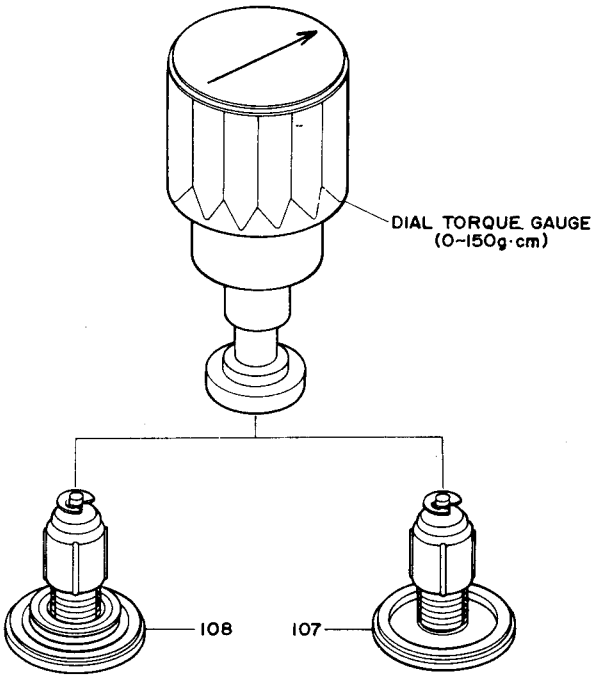


Figure 30

13. BACK TENSION TORQUE CHECK (Refer to Fig. 31)

	TORQUE
PLAY mode	less than 1g·cm (0.14 oz·inch)
REWIND mode	less than 6g.cm (0.71 oz·inch)

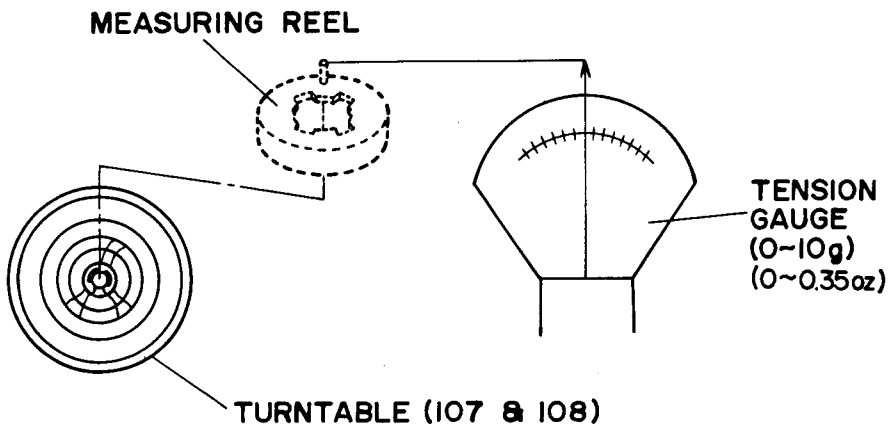


Figure 31

14. CASSETTE HOLDER FALL TIME ADJUSTMENT (Refer to Fig. 32)

1) Check that the cassette tape exactly falls into the cassette holder (112) when inserted.
For adjustment, refer to the figure.

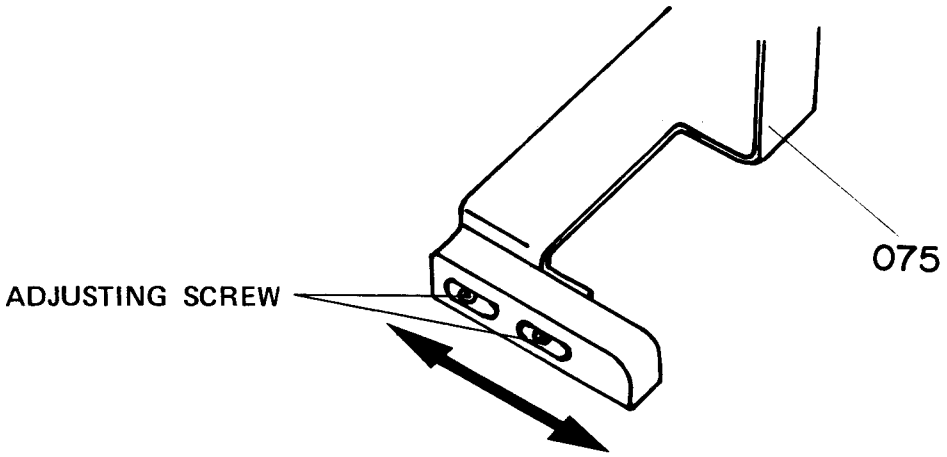


Figure 32

ELECTRICAL MEASUREMENT

SPECIAL EQUIPMENT REQUIRED

The following items will be required for performing electrical checks and adjustments:

1. DC constant-voltage power source (DC 20.0V)
2. DC voltmeter (DC 20V)
3. V.T.V.M.
4. Frequency counter
5. Signal generator
6. Attenuator
7. Distortion meter
8. Test tape (MTT-113, 6.3kHz recorded)
9. Oscilloscope
10. 8 ohm dummy resistor (±5%, 10W)
11. Test tape (MTT-112, 333Hz recorded)
12. Test tape (MTT-117A 63Hz, 1kHz, 8kHz recorded)
13. Blank tape
14. AC ammeter
15. Band Pass Filter (1 kHz)

1. POWER AMPLIFIER CHECK (Refer to Fig. 33)

1) Set Mode Selector Switch (SW-8) at "CASSETTE PLAY".
2) Set VOLUME Control (R207, R208), RECORD MONITOR VOLUME Control (R213, R214) in the minimum position, and BASS Control (R209, R210) and TREBLE Control (R211, R212) in the central position.
3) Connect DC constant voltage power source (DC 20.0V) to the power lead wire of main amplifier.
4) Connect PLUS side of DC voltmeter to TP101 (TP102) and MINUS side to TP2. Adjust R307 (R308) so that the voltmeter's reading becomes 10.0V.
5) Connect PLUS side of DC voltmeter to TP103 (TP104) and MINUS side to TP105 (TP106). Adjust R317 (R318) so that voltmeter's reading becomes 20mV.

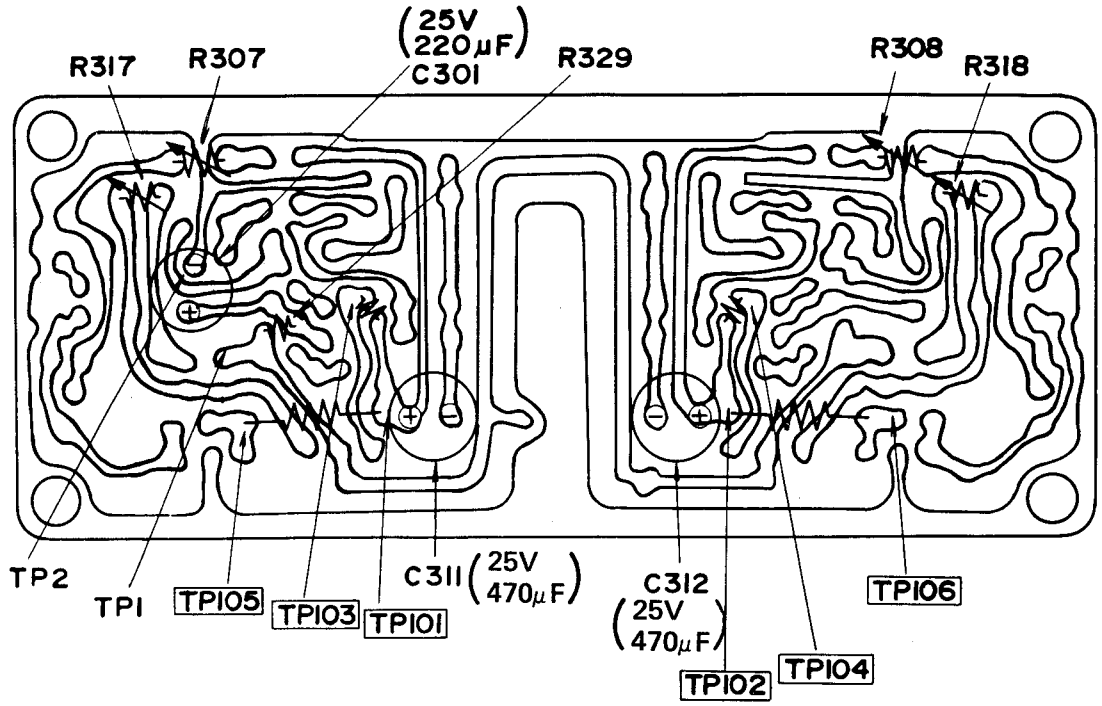


Figure 33

2. RECORD AMPLIFIER BIAS OSCILLATOR CHECK (Refer to Fig. 34)

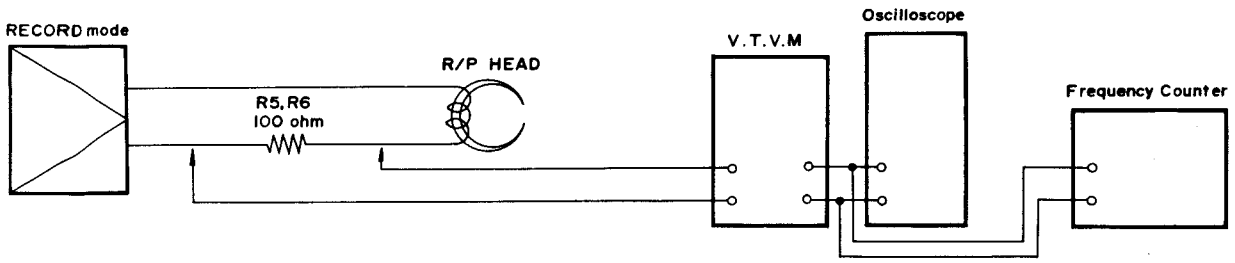


Figure 34

1) Set Mode Selector Switch (SW-8) at "CASSETTE PLAY".
2) Set the unit at RECORD mode.
3) Shift R.I.F. Switch (SW-4) to "A".
4) Connect V.T.V.M. to Test Point (R5, R6).
5) Adjust Semi-variable resistor (R409, R410) so that VTVM's reading becomes 50mV.
6) Adjust Oscillator Coil (L401) so that the frequency counter's reading becomes 53.5kHz±1.5kHz.
7) After checking bias frequency, re-check for the item 5.
8) Then shift R.I.F. switch (SW-4) to "B" and check that bias frequency becomes 52.25kHz±10%.

3. ERASE VOLTAGE CHECK (Refer to Fig. 35)

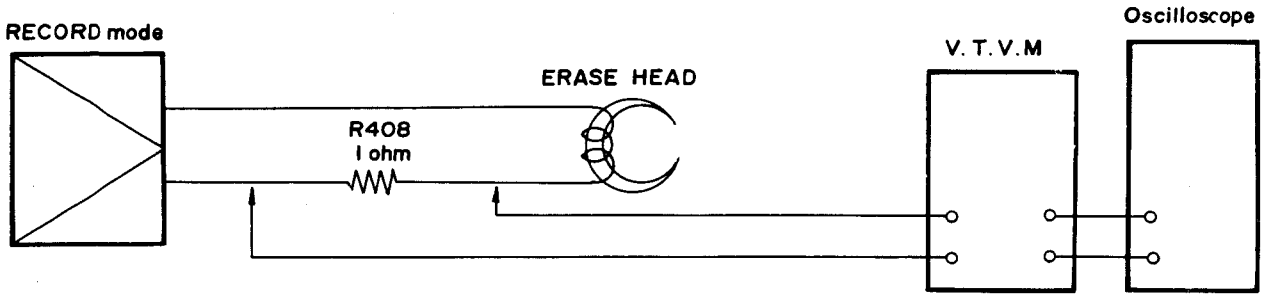


Figure 35

1) Set Mode Selector Switch (SW-8) at "CASSETTE PLAY".
2) Then set the unit at RECORD mode.
3) Set R.I.F. Switch (SW-4) at "A".
4) Connect VTVM to Resistor (R408).
5) It is normal if VTVM's reading is then over 55mV.

4. LEVEL METER SENSITIVITY CHECK (Refer to Fig. 36)

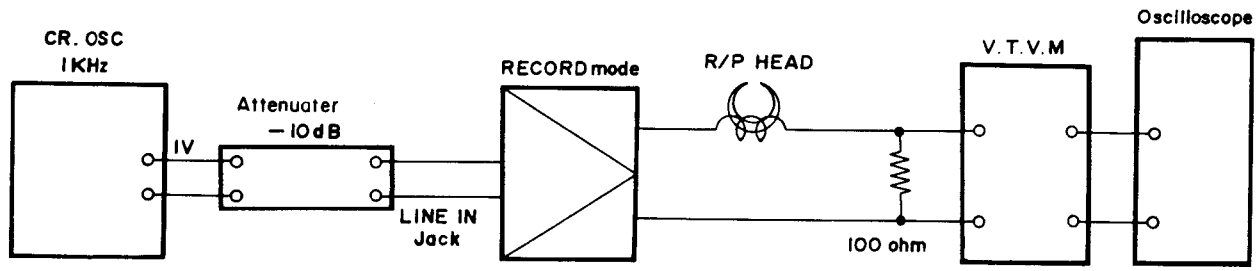


Figure 36

1) Set Mode Selector Switch (SW-8) at "CASSETTE PLAY".
2) Set RECORD MONITOR VOLUME Control (R213, R214) in the maximum positions, and BASS Control (R209, R210) and TREBLE Control (R211, R212) in the central positions.
3) Remove the ground lead of bias circuit at main amplifier and stop bias oscillation.
4) Set the unit at RECORD mode.
5) Input -10dB, 1kHz signal to LINE IN Jack (SO701, SO702) and adjust VOLUME Control (R207, R208) so that voltage at both ends of resistor (R5, R6) becomes 3.5mV.
6) Adjust Semi-variable resistor (R119, R120) so that LEVEL meter indicates OVU.

5. RECORD AMPLIFIER SENSITIVITY CHECK (Refer to Fig. 37)

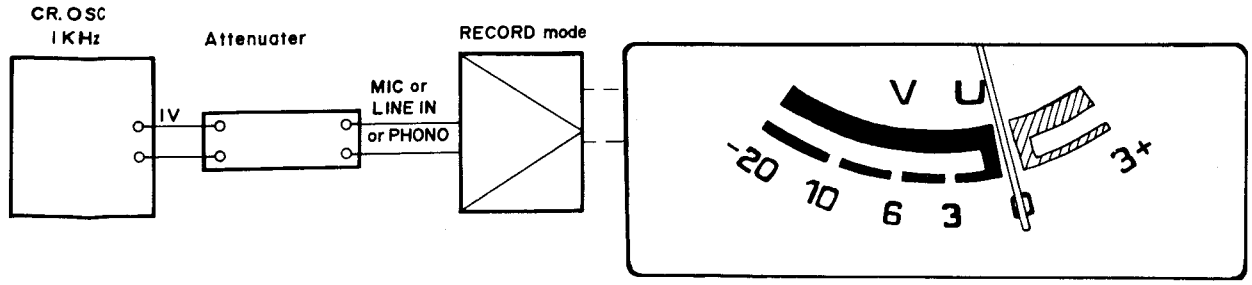


Figure 37

1) Set RECORD MONITOR VOLUME Control (R213, R214) in the maximum position, and BASS Control (R209, R210) and TREBLE Control (R211, R212) in the central positions. Set VOLUME Control (R207, R208) in the maximum position.
2) Set the unit at RECORD mode.
3) Remove the ground lead of bias circuit at the main amplifier and stop bias oscillation.
4) Input 1kHz signal to MICROPHONE Jack (J701, J702). Microphone sensitivity is normal if attenuator's reading is within the range of -76 dB to -84 dB when LEVEL meter indicates OVU.
5) Do the same for LINE IN Jack (SO701) as did for microphone. LINE IN sensitivity is normal if attenuator's reading is within -22 dB to -30 dB.
6) Do the same also for PHONO Jack (SO702) as did for microphone. PHONO sensitivity is normal if attenuator's reading is within -56 dB to -64 dB.

NOTES: 1) The check must be done after the LEVEL METER Sensitivity Check.
2) Channel to channel sensitivity must be within 4 dB.

6. RECORD AMPLIFIER FREQUENCY CHARACTERISTIC CHECK (Refer to Fig. 38)

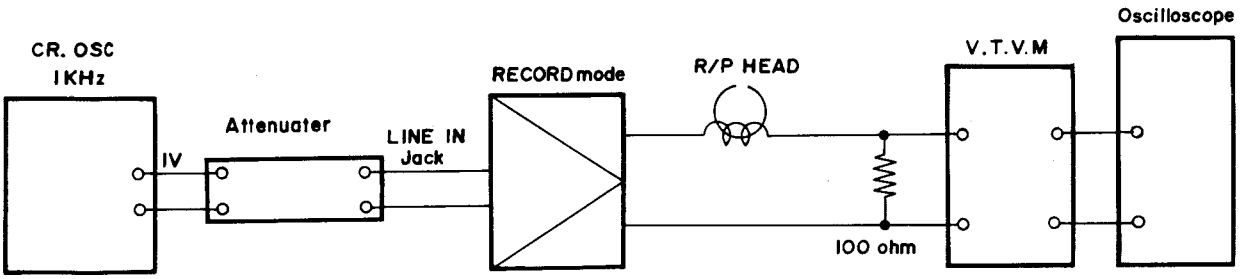


Figure 38

1) Set Mode Selector Switch (SW-8) at the position of "CASSETTE PLAY".
2) Set RECORD MONITOR VOLUME Control (R213, R214) in the maximum position, and BASS Control (R209, R210) and TREBLE Control (R211, R212) in the central position.
3) Set the unit at RECORD mode.
(Remove the ground lead of bias circuit at the main amplifier and stop bias oscillation.)
4) Input -10 dB, 1kHz signal to LINE IN Jack (SO701) and adjust VOLUME Control (R207, R208) so that voltage at both ends of resistor (R5, R6) becomes 1mV.
5) Then change the oscillator frequency to 63Hz and 8kHz and if deviations to 1mV are within -1 dB to +3 dB and +10 dB to +14 dB, respectively, the RECORD AMPLIFIER frequency characteristic is normal.

7. PLAYBACK AMPLIFIER SENSITIVITY CHECK (Refer to Fig. 39)

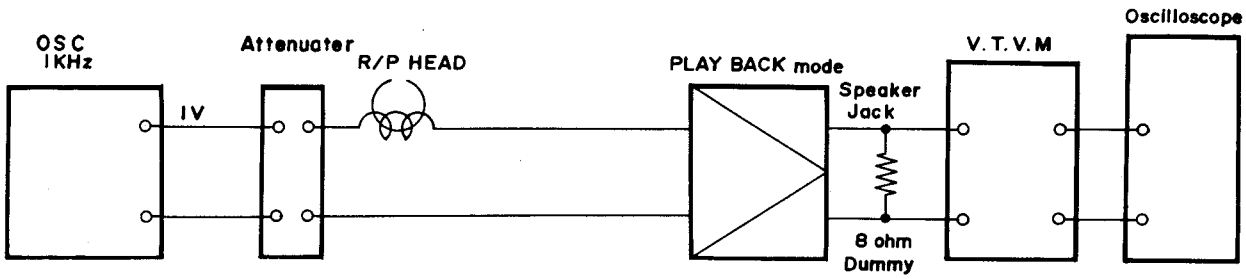


Figure 39

1) Set Mode Selector Switch (SW-8) at "CASSETTE PLAY".
2) Set VOLUME Control (R207, R208) in the maximum position, BASS Control (R209, R210) and TREBLE Control (R211, R212) in the central position.
3) Set the unit at PLAYBACK mode.
4) Disconnect the ground lead wires (red) of Record/Playback head for both channels. Input 1kHz signal between head terminal and lead wire.
5) Connect 8 ohm (±5%, 10W) dummy resistor to Speaker Jack (SO704, SO705)
   PLAYBACK AMPLIFIER sensitivity is normal if attenuator's reading is -78 dB to -84 dB when voltage at both ends of resistor becomes 3.3V.

8. PLAYBACK AMPLIFIER FREQUENCY CHARACTERISTIC CHECK (Refer to Fig. 39)

1) Set Mode Selector Switch (SW-8) at "CASSETTE PLAY".
2) Set BASS Control (R209, R210) and TREBLE Control (R211, R212) in the central position.
3) Set the unit at PLAYBACK mode.
4) Disconnect the ground lead wire (red) of Record/Playback head for both channels.
   Input 1kHz, -81 dB signal between head terminal and lead wire.
5) Connect 8 ohm (±5%, 10W) dummy resistor to speaker jack (SO704, SO705) and adjust VOLUME Control (R207, R208) so that voltage at both ends of resistor becomes 0.2V.
6) Then change the frequency of signal generator to 63Hz and 8kHz, and if deviations to 0.2V are +13.5 dB to +19.5 dB and +1 dB to -5 dB, respectively, the PLAYBACK AMPLIFIER frequency characteristic is normal.

9. TONE CHARACTERISTIC CHECK (Refer to Fig. 40)

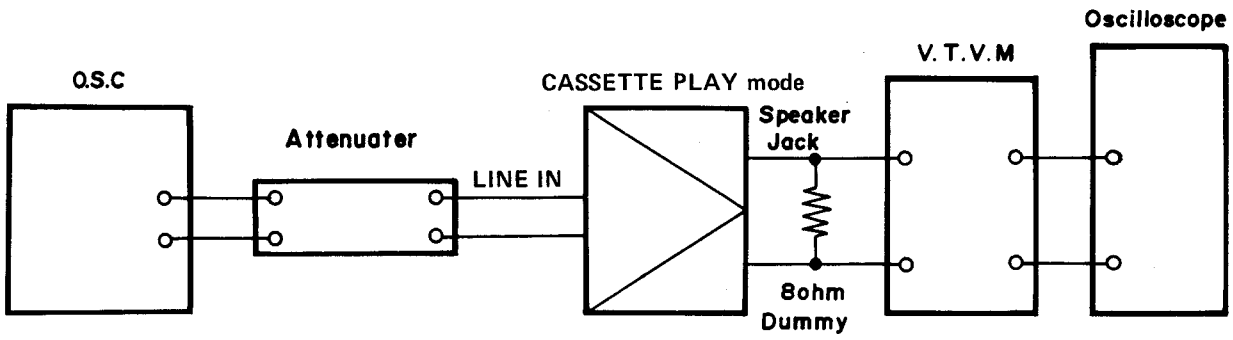


Figure 40

1) Set Mode Selector Switch (SW-8) at "LINE IN".
2) Set BASS Control (R209, R210) and TREBLE Control (R211, R212) in the central positions.
3) Set the unit at RECORD mode, and RECORD MONITOR VOLUME Control (R213, R214) in the maximum position.
4) Input -10 dB, 1kHz signal to LINE IN jack (SO701) and connect 8 ohm (±5%, 10W) dummy resistor to Speaker Jack (SO704, SO705) and adjust VOLUME Control (R207, R208) so that voltage at both ends becomes 0.2V.
5) Set the signal of signal generator at 125Hz and then output voltage is 0 dB.
6) At the time it is normal if the output deviation is within +5.5 to +9.5 dB when BASS Control (R209, R210) is set at BOOST and within -7.5 to -11.5 dB when it is set at CUT.
7) Set the signal of signal generator at 8kHz and then output voltage is 0 dB.
8) It is normal if the output deviation is within +5 to +9 dB when TREBLE Control (R211, R212) is set at BOOST and within -10.5 to -14.5 dB when it is set at CUT.

10. RECORD/PLAYBACK HEAD ADJUSTMENT (Refer to Fig. 41)

1) Set Mode Selector Switch (SW-8) at "CASSETTE PLAY".
2) Set BASS Control (R209, R210) and TREBLE Control (R211, R212) in the central positions.
3) Connect 8 ohm (±5%, 10W) dummy resistor to Speaker Jack (SO704, SO705) and VTVM to its ends.

4) Insert the test tape (MTT-113, 6.3kHz Recorded) into the unit.
5) Set the unit at PLAYBACK mode and adjust Head Azimuth Adjustment Screw (A) so that VTVM's reading becomes maximum for both channel 1 and channel 2.
NOTE: Be sure to apply a lock paint to screw (A) after adjustment.

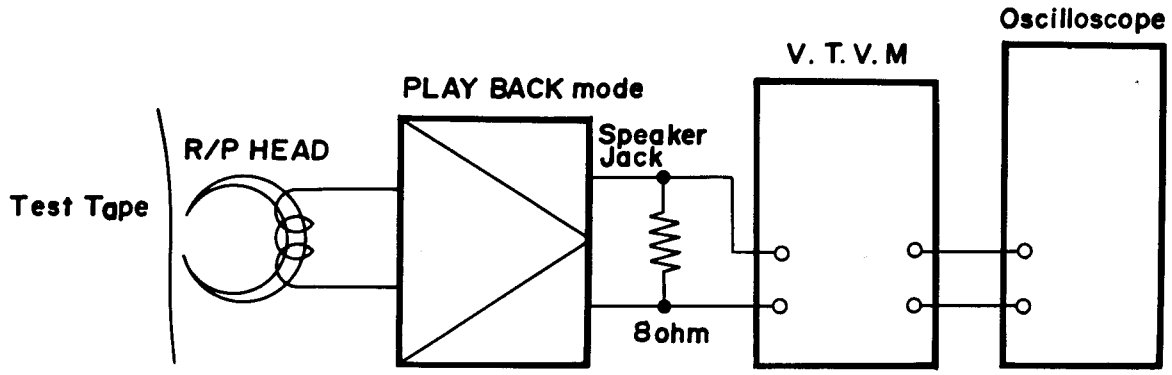


Figure 41

11. PLAYBACK SENSITIVITY VOLTAGE CHECK (Refer to Fig. 41)

1) Set Mode Selector Switch (SW-8) at "CASSETTE PLAY".
2) Set VOLUME Control (R207, R208) in the maximum position, and BASS Control (R209, R210) and TREBLE Control (R211, R212) in the central position.
3) Insert the Test tape (MTT-112, 333Hz Recorded) into the unit and set it at PLAYBACK mode.
4) Connect 8 ohm (±5%, 10W) dummy resistor to Speaker Jack (SO704, SO705).
It is normal if voltage at both ends is within the range 1.3V ~ 2.5V.
5) Output voltage deviation should be below 4 dB for both channel 1 (left) and channel 2 (right).
NOTE: The check must be done after RECORD/PLAYBACK HEAD ADJUSTMENT.

12. PLAYBACK FREQUENCY CHARACTERISTIC CHECK (Refer to Fig. 41)

1) Set Mode Selector Switch (SW-8) at "CASSETTE PLAY".
2) Set BASS Control (R209, R210) and TREBLE Control (R211, R212) in the central position.
3) Insert the Test tape (MTT-117A, 63Hz, 1kHz, 8kHz, Recorded) into the unit and set it at PLAYBACK mode.
4) Connect 8 ohm (±5%, 10W) dummy resistor to Speaker Jack (SO704, SO705) and adjust VOLUME Control (R207, R208) so that voltage at both ends becomes 0.5V at 1kHz and 0.5V is to be 0 dB.
5) Then playback 63Hz and 8kHz, and check output deviation to 1kHz. PLAYBACK frequency characteristic is normal if deviation is -3 dB to +7 dB at 63Hz and -5 dB to +5 dB at 8kHz.
NOTE: Demagnetize Record/Playback head and guide before checking.

13. GENERAL FREQUENCY CHARACTERISTIC CHECK (Refer to Fig. 42)

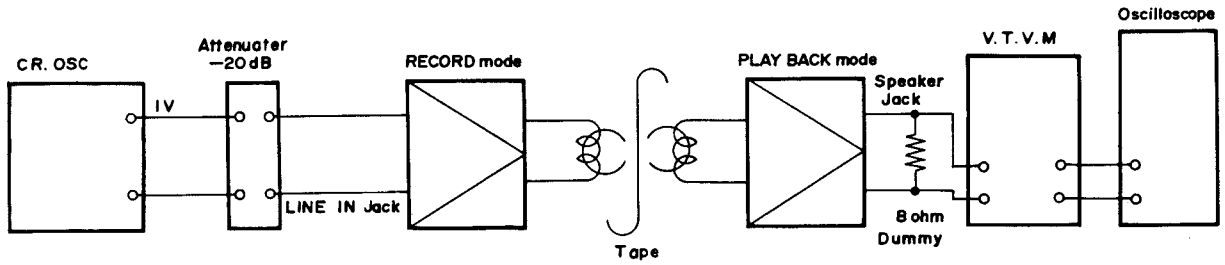


Figure 42

1) Set Mode Selector Switch (SW-8) at "CASSETTE PLAY".
2) Set BASS Control (R209, R210) and TREBLE Control (R211, R212) in the central position.
3) Set R.I.F. Switch (SW-4) at "A".
4) Insert the cassette tape (not recorded) into the unit and set it at RECORD mode.
5) Connect 8 ohm (±5%, 10W) dummy resistor to Speaker jack (SO704, SO705) and VTVM to the ends.
6) Input -10 dB, 1kHz signal to LINE IN Jack (SO701). Adjust VOLUME Control (R207, R208) so that LEVEL meter indicates OVU. Henceforth, make the input level -20 dB and record 1kHz, 63 Hz, 8kHz signals.

14. DIN INPUT/OUTPUT SENSITIVITY CHECK (Refer to Fig.43)

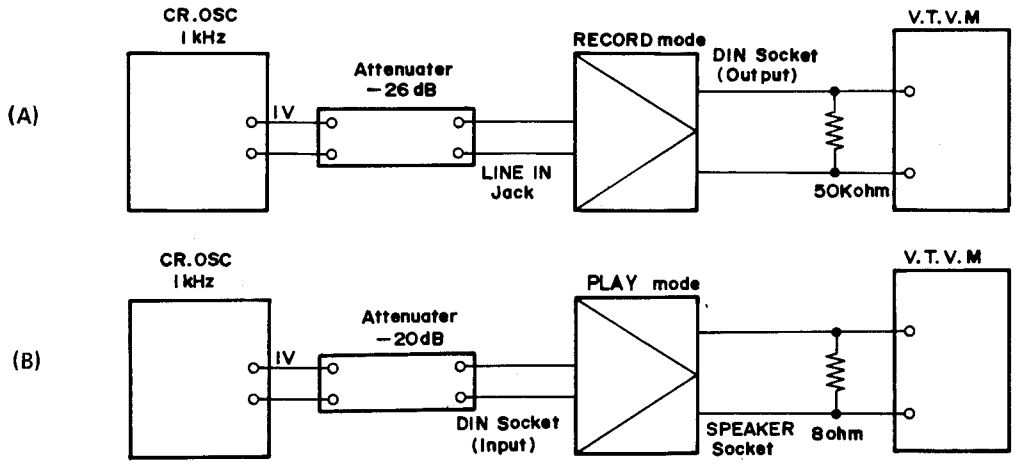


Figure 43

(A) 1) Set Mode Selector Switch (SW−8) at "CASSETTE PLAY".
2) Insert the cassette tape into the unit and set it at RECORD mode.
3) Input -26dB, 1kHz signal to LINE IN Jack (SO701).
4) Connect 50K ohm dummy resistor to DIN Socket (Output terminal).
It is normal if voltage at both ends is within the range -34 dB.

(B) 1) Pull out Record Monitor control knob.
2) Input 1kHz signal to DIN Socket (Input terminal).
3) Connect 8 ohm (±5%, 10W) dummy resistor to Speaker jack (SO704, SO705). and VTVM to the ends.
4) Adjust Input Signal Level so that V.T.V.M. reading 3.3V. Henceforth, make the input level -20dB.

15. CHANNEL TO CHANNEL CROSSTALK (Refer to Fig. 43)

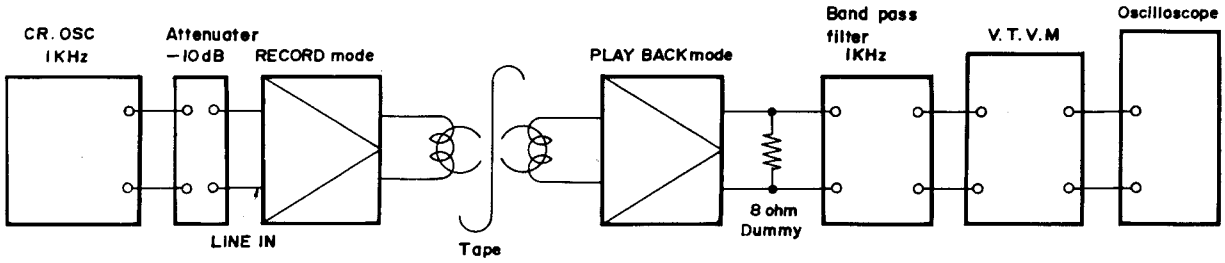


Figure 44

1) Set Mode Selector Switch (SW-8) at "CASSETTE PLAY".
2) Set BASS Control (R209, R210) and TREBLE Control (R211, R212) in the central positions.
3) Set R.I.F. Switch (SW-W) at "A".
4) Insert a blank cassette into the unit and input -10 dB, 1kHz signal to LINE IN jack and record only in one channel in the maximum position of VOLUME control (R207, R208).
5) Playback the tape after recording and connect 8 ohm dummy to Speaker jack (SO704, SO705) and adjust VOLUME Control so that voltage at both ends of dummy becomes 3.3V.
   Henceforth, output voltage through 1kHz Band Pass Filter is to be 0 dB.
6) Adjust VOLUME Control of the blank channel to the position of VOLUME Control of the recorded channel mechanically.
7) Measure voltage at both ends of 8 ohm dummy through 1kHz Band Pass Filters. It is normal if deviation to to output voltage compared with the above 5 is over 25 dB.

16. MEASUREMENT OF CURRENT CONSUMED (Refer to Fig. 44)

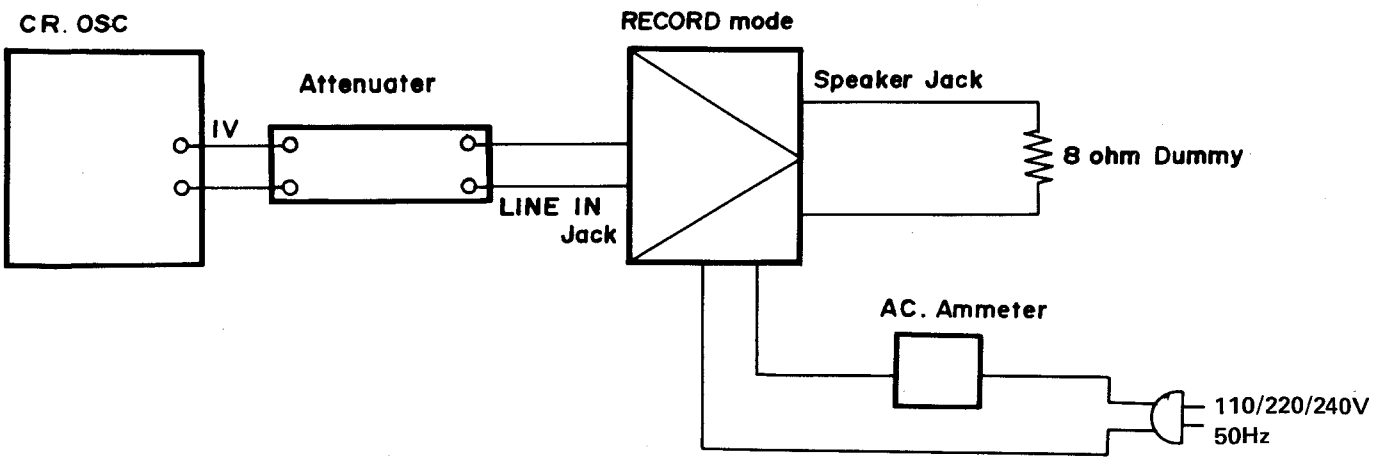


Figure 45

1) Set Mode Selector Switch (SW-8) at "CASSETTE PLAY" and BASS Control (R209, R210) and TREBLE Control (R211, R212) in the central positions.
2) Set RECORD MONITOR Control (R213, R214) in the maximum position.
3) Insert a cassette tape and set the unit at RECORD mode.
4) Input -10 dB, 1kHz signal from LINE IN Jack (SO701). Adjust VOLUME control and record at OVU.
5) It is normal if current consumed in this mode is within 150 – 250mA(@220V).

ALIGNMENT INSTRUCTIONS OF TUNER

Alignment is an exacting procedure and should be undertaken only when necessary.
If alignment of AM and FM is required, either section may be done first.
The FM stereo section, however, should be done only if the FM monaural section is properly adjusted.
Notes: Don't use a metallic screw driver.

REQUIRED EQUIPMENT:

1. Signal generator with a frequency range of 455kHz to 1650kHz: AM
2. Signal generator with a frequency range of 86.5MHz to 108.5MHz: FM
3. Signal generator with a frequency output of 10.7MHz±0.5MHz: FM
4. Vacuum tube voltmeter (AC-VTVM)
5. Sweep signal generator with a sweep range of at least 500kHz and center frequency of 10.7MHz with at least a 10.7MHz marker. (Ext. marker may be used.)
6. Oscilloscope with a wide range amplifier of approximately 100kHz.
7. Test loops, a coil of any size wire, one turn or more.
8. FM stereo signal generator.
9. Audio signal generator with a frequency of 20Hz to 100kHz.

Notes: Allow the set at least five minutes to warm up before attempting alignment. During alignment keep the signal generator output at the lowest level that will maintain a usable output from the set, except for FM stereo signal generator. Take much care, lest the grounding of FM sweep signal generator input should make multipaths which made FM IF alignment incorrect. To avoid this the grounding lead may be connected through 0.01–0.04 MFD capacitor to the tuner chassis when sweep generator is connected to the tuner section.

Ground connection of signal generator	chassis ground
Generator modulation (AM)	30%, 400Hz
Generator modulation (FM)	22.5kHz, 400Hz
Generator modulation (FM stereo)	CH.L. or CH.R. 11.25kHz, 1000Hz Mod.

ALIGNMENT PROCEDURE

AM ALIGNMENT

PROCEDURE NUMBER	Signal Generator		Dial Pointer Setting	Function Setting	Meter Connection	Adjustment	Remarks
	Connection	Frequency					
1 (IF)	Thru 0.01 MFD to Q 904 Base as small as possible	455kHz (SG or sweep)	High end of Dial	AM	Oscilloscope connected to TP-903	T904 T905 T906	Repeat 2 or 3 times
2	Radiated Signal as small as possible	515kHz Modulated	Low end of Dial	AM	VTVM connected across TP-903	Oscillator coil L902	Same as above
3	Radiated Signal as small as possible	1650kHz Modulated	High end of Dial	AM	VTVM connected across TP-903	Oscillator Trimmer TC805	Same as above
4	Radiated Signal as small as possible	1400kHz Modulated	1400kHz	AM	VTVM connected across TP-903	Tuning Trimmer TC804	Same as above
5	Radiated Signal as small as possible	600kHz Modulated	600kHz	AM	VTVM connected across TP-903	Antenna coil L-805	Same as above
6	If necessary, repeat step 2-step 5.						

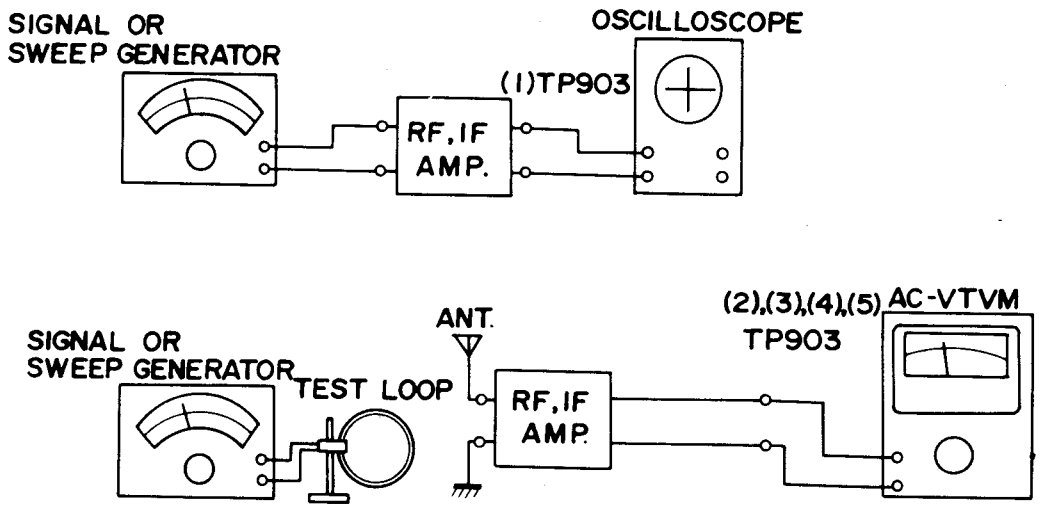


Figure 46 AM ALIGNMENT EQUIPMENT CONNECTIONS

FM IF ALIGNMENT

PROCEDURE NUMBER	Signal Generator		Dial Pointer Setting	Function Setting	Scope Connection	Adjustment	Remarks
	Connection	Frequency					
1	Detune T903 completely.						
2	Thru 10 PFD to TP801	10.7MHz ± 300KHz	High end of Dial	FM Stereo	TP-901	T801, T901 T902	Set curve at maximum as shown in the Figure 46- A Repeat 2 or 3 times.
3	Same as above	10.7MHz ±400kHz	High end of Dial	FM Stereo	TP-904 or TP-905	T903	Adjust "S" curve at maximum. Adjust 10.7MHz at the center of "S" curve.
4	Repeat adjustments to obtain "S" curve as shown in Figure 46.						

PRECAUTIONS ON DETUNING

Turn the core of T903 two or more times.

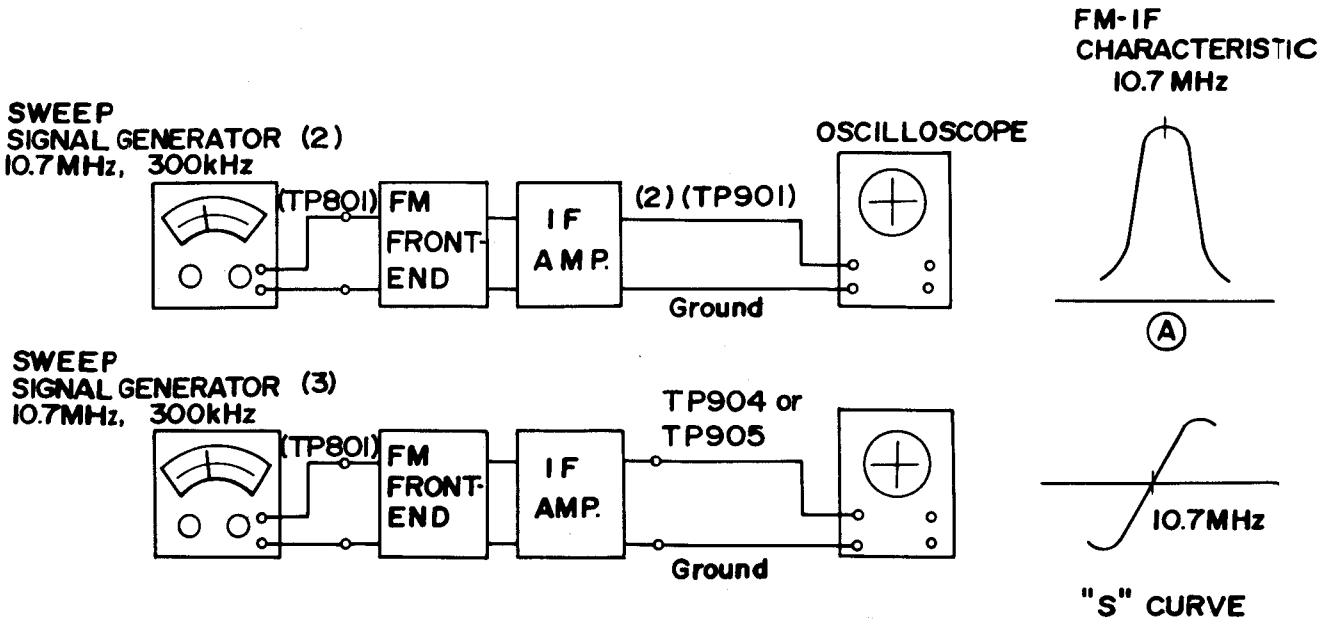


Figure 47 FM IF ALIGNMENT EQUIPMENT CONNECTIONS

FM RF ALIGNMENT

PROCEDURE NUMBER	Signal Generator		Dial Pointer Setting	Function Setting	Meter Connection	Adjustment	Remarks
	Connection	Frequency					
1	FM-ANT Terminal (through 300 ohm matching pad)	107MHz Modulated	High end of Dial	FM Stereo	Across TP-904 or TP-905	Oscillator Trimmer TC-803	
2	Same as above	87.5MHz Modulated	Low end of Dial	FM Stereo	Same as above	Oscillator Coil L804	
3	Same as above	106MHz Modulated	106MHz	FM Stereo	Same as above	Tuning Trimmer TC-801 and then RF Trimmer TC-802	
4	Same as above	90MHz Modulated	90MHz	FM Stereo	Same as above	Tuning Coil L801 (a, b,) and then RF Coil L802 (a, b)	
5	If necessary, repeat step 1-step 4.						

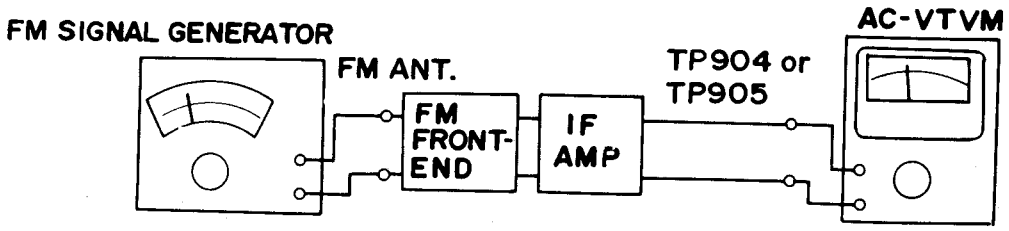


Figure 48 FM RF ALIGNMENT EQUIPMENT CONNECTIONS

FM STEREO ALIGNMENT

PROCEDURE NUMBER	Stereo Signal Generator		Tuning Frequency	Function Setting	Scope Connection	Adjustment	Remarks
	Connection	Mod. Frequency					
1	FM-ANT	19kHz Mod. level as small as possible	98MHz	FM stereo	TP-907 (Sensitivity Max.)	L903 (Respectively)	Get the maximum point. Repeat 2 or 3 times.
2	FM-ANT	Same as above	98MHz	FM stereo	TP-906 (Sensitivity Max.)	L904 (Respectively)	Same as above
3	FM-ANT	19kHz 10% Mod.	98MHz	FM stereo	TP-908	L905	Get the maximum point.
4	FM-ANT	1000Hz Ch. L only	98MHz	FM stereo	TP-904	L905 (Readjust).	Get the maximum output point. Counter-clockwise 1/16-1/8 turn.
5	FM-ANT	1000Hz Ch. L only	98MHz	FM stereo	TP-905	R946	Get the minimum output point.

Note: Output level of FM Signal Generator which is modulated by a FM Stereo Signal Generator shall be 1mV. (60dB)

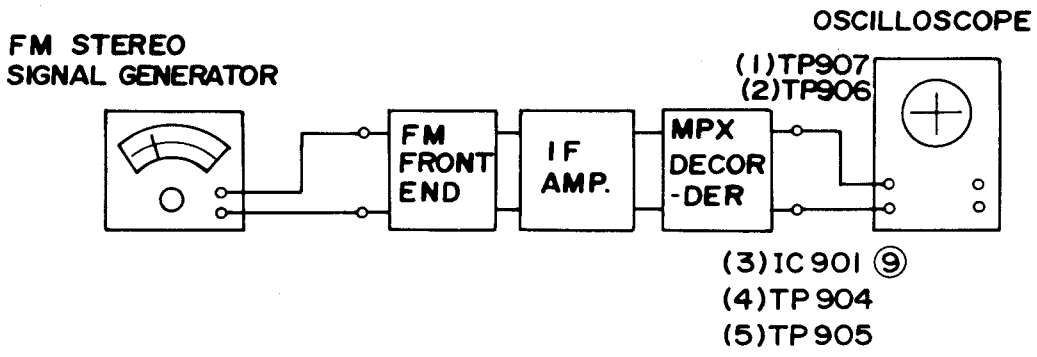
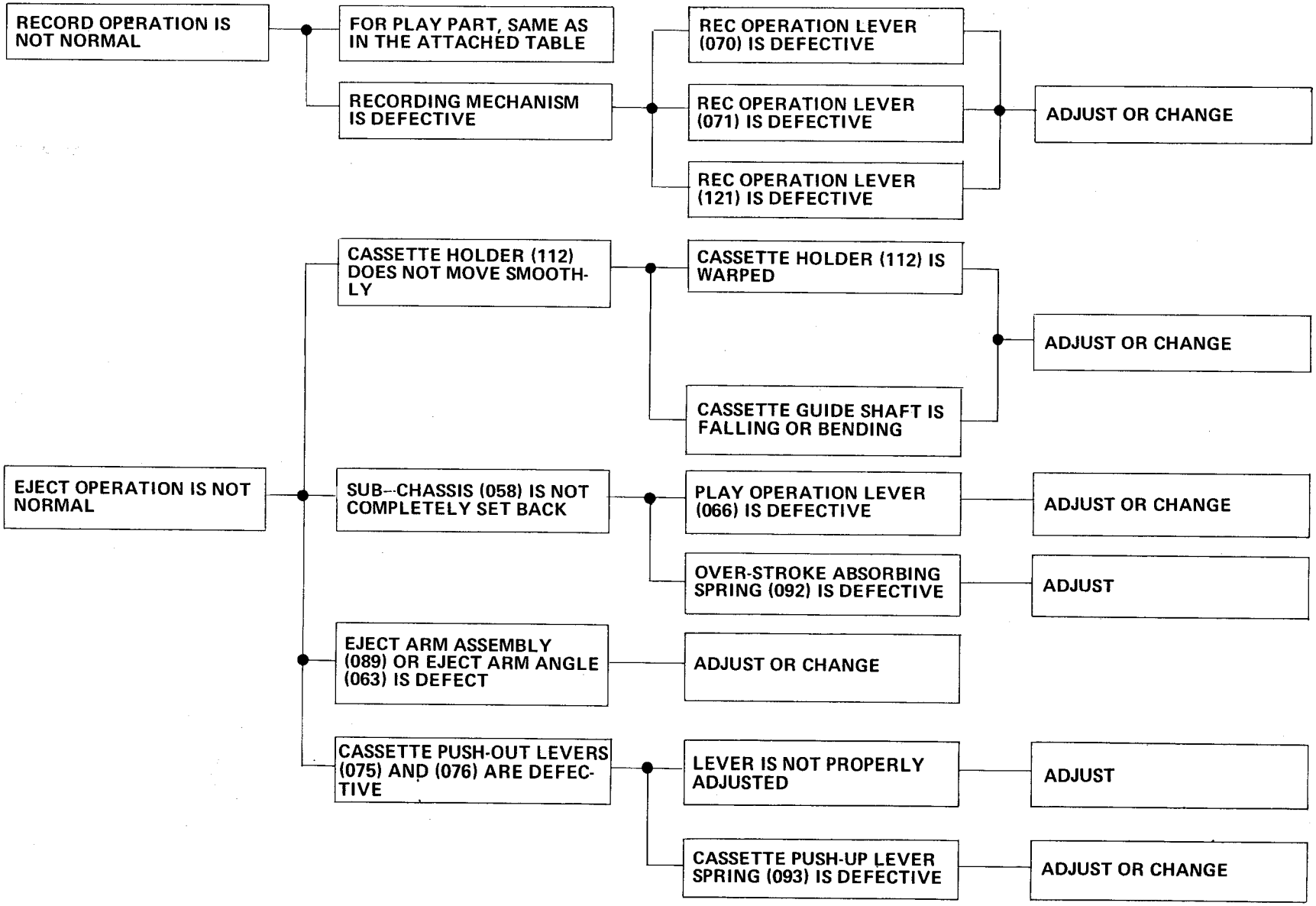
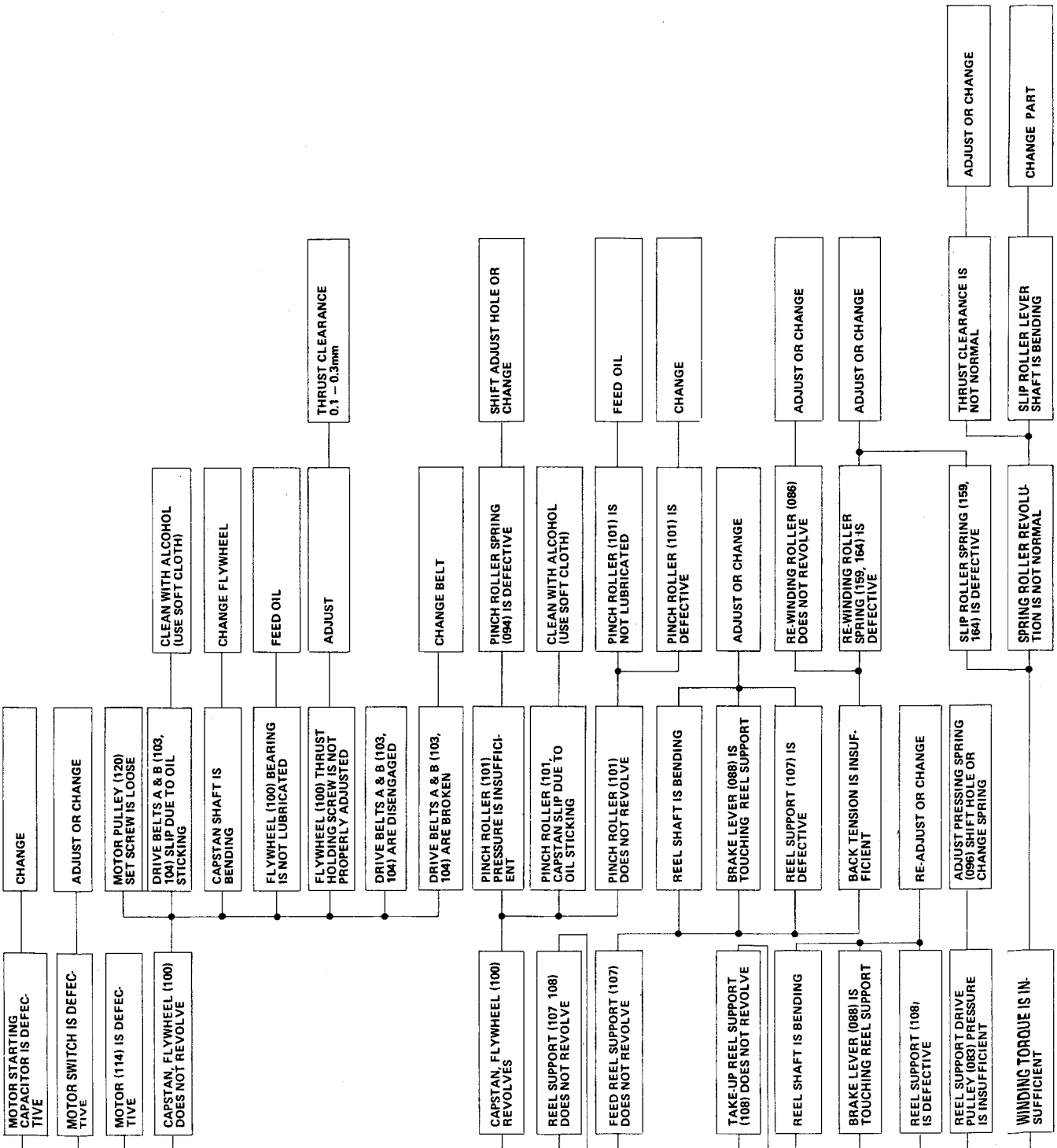


Figure 49 FM STEREO ALIGNMENT EQUIPMENT CONNECTIONS

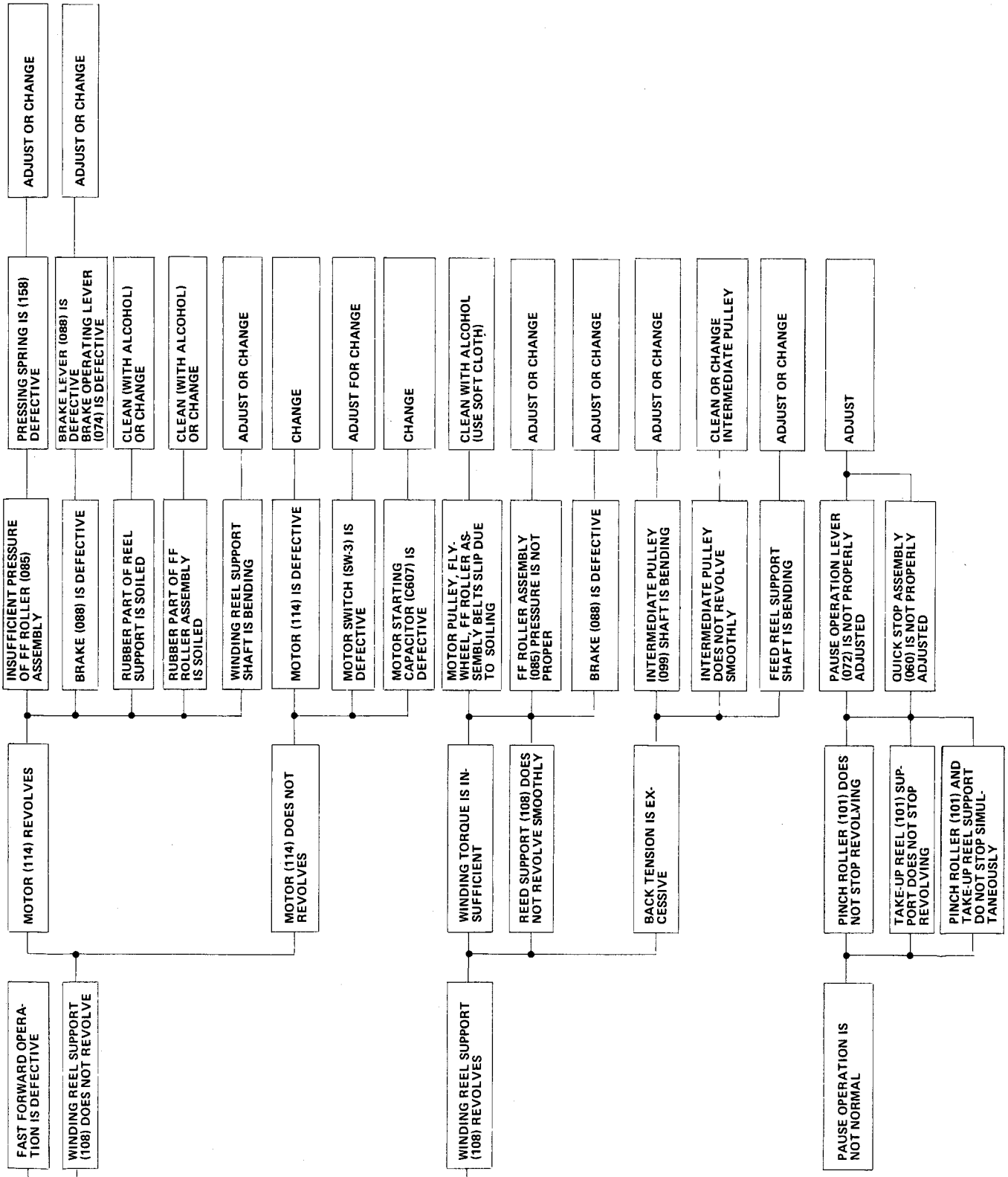
TROUBLE SHOOTING CHART OF MECHANISM (1)


RECORD OPERATION IS NOT NORMAL
FOR PLAY PART, SAME AS IN THE ATTACHED TABLE
RECORDING MECHANISM IS DEFECTIVE
REC OPERATION LEVER (070) IS DEFECTIVE
REC OPERATION LEVER (071) IS DEFECTIVE
REC OPERATION LEVER (121) IS DEFECTIVE
ADJUST OR CHANGE
EJECT OPERATION IS NOT NORMAL
CASSETTE HOLDER (112) DOES NOT MOVE SMOOTHLY
CASSETTE HOLDER (112) IS WARPED
CASSETTE GUIDE SHAFT IS FALLING OR BENDING
ADJUST OR CHANGE
SUB--CHASSIS (058) IS NOT COMPLETELY SET BACK
PLAY OPERATION LEVER (066) IS DEFECTIVE
ADJUST OR CHANGE
OVER-STROKE ABSORBING SPRING (092) IS DEFECTIVE
ADJUST
EJECT ARM ASSEMBLY (089) OR EJECT ARM ANGLE (063) IS DEFECT
ADJUST OR CHANGE
CASSETTE PUSH-OUT LEVERS (075) AND (076) ARE DEFECTIVE
LEVER IS NOT PROPERLY ADJUSTED
ADJUST
CASSETTE PUSH-UP LEVER SPRING (093) IS DEFECTIVE
ADJUST OR CHANGE

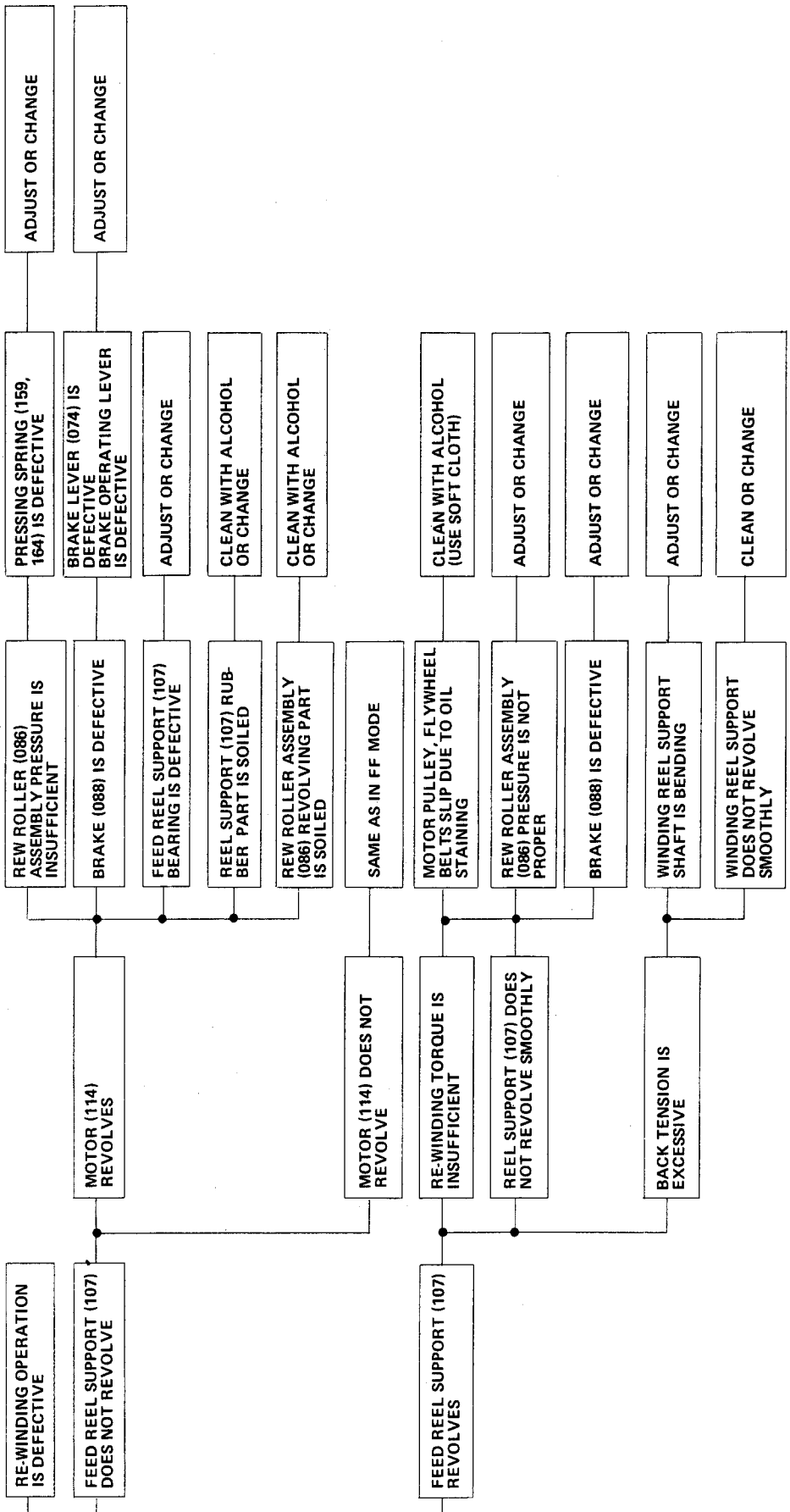
TROUBLE SHOOTING CHART OF MECHANISM (2)


RECORDING AND PLAYING OPERATIONS ARE NOT NORMAL
MOTOR (114) DOES NOT OPERATE
MOTOR (114) OPERATES
MOTOR STARTING CAPACITOR IS DEFECTIVE
MOTOR SWITCH IS DEFECTIVE
MOTOR (114) IS DEFECTIVE
CAPSTAN, FLYWHEEL (100) DOES NOT REVOLVE
CHANGE
ADJUST OR CHANGE
MOTOR PULLEY (120) SET SCREW IS LOOSE
DRIVE BELTS A & B (103, 104) SLIP DUE TO OIL STICKING
CAPSTAN SHAFT IS BENDING
FLYWHEEL (100) BEARING IS NOT LUBRICATED
FLYWHEEL (100) THRUST HOLDING SCREW IS NOT PROPERLY ADJUSTED
DRIVE BELTS A & B (103, 104) ARE DISENGAGED
DRIVE BELTS A & B (103, 104) ARE BROKEN
CLEAN WITH ALCOHOL (USE SOFT CLOTH)
CHANGE FLYWHEEL
FEED OIL
ADJUST
THRUST CLEARANCE 0.1 – 0.3mm
CHANGE BELT
CAPSTAN, FLYWHEEL (100) REVOLVES
REEL SUPPORT (107 108) DOES NOT REVOLVE
FEED REEL SUPPORT (107) DOES NOT REVOLVE
PINCH ROLLER (101) PRESSURE IS INSUFFICIENT
PINCH ROLLER (101, CAPSTAN SLIP DUE TO OIL STICKING
PINCH ROLLER (101) DOES NOT REVOLVE
SHIFT ADJUST HOLE OR CHANGE
CLEAN WITH ALCOHOL (USE SOFT CLOTH)
PINCH ROLLER (101) IS NOT LUBRICATED
FEED OIL
TAKE-UP REEL SUPPORT (108) DOES NOT REVOLVE
REEL SHAFT IS BENDING
BRAKE LEVER (088) IS TOUCHING REEL SUPPORT
REEL SUPPORT (107) IS DEFECTIVE
BACK TENSION IS INSUFFICIENT
RE-ADJUST OR CHANGE
PINCH ROLLER (101) IS DEFECTIVE
CHANGE
ADJUST OR CHANGE
REEL SHAFT IS BENDING
BRAKE LEVER (088) IS TOUCHING REEL SUPPORT
REEL SUPPORT (108) IS DEFECTIVE
RE-WINDING ROLLER (086) DOES NOT REVOLVE
RE-WINDING ROLLER SPRING (159, 164) IS DEFECTIVE
ADJUST OR CHANGE
ADJUST OR CHANGE
REEL SUPPORT DRIVE PULLEY (083) PRESSURE IS INSUFFICIENT
ADJUST PRESSING SPRING (096) SHIFT HOLE OR CHANGE SPRING
SLIP ROLLER SPRING (159, 164) IS DEFECTIVE
THRUST CLEARANCE IS NOT NORMAL
ADJUST OR CHANGE
WINDING TORQUE IS INSUFFICIENT
SPRING ROLLER REVOLUTION IS NOT NORMAL
SLIP ROLLER LEVER SHAFT IS BENDING
CHANGE PART

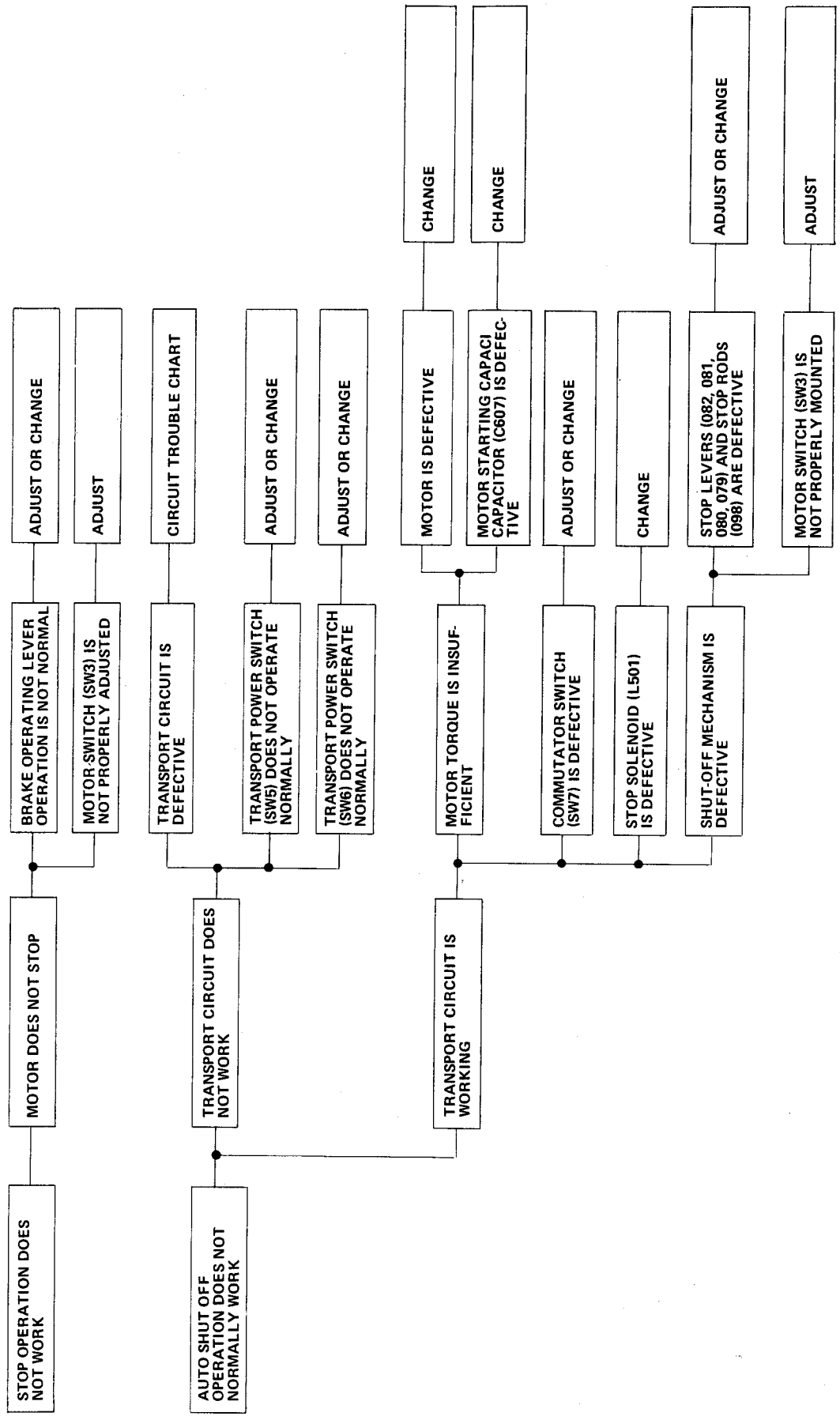
TROUBLE SHOOTING CHART OF MECHANISM (3)


FAST FORWARD OPERATION IS DEFECTIVE
WINDING REEL SUPPORT (108) DOES NOT REVOLVE
MOTOR (114) REVOLVES
INSUFFICIENT PRESSURE OF FF ROLLER (085) ASSEMBLY
PRESSING SPRING IS (158) DEFECTIVE
ADJUST OR CHANGE
BRAKE (088) IS DEFECTIVE
BRAKE LEVER (088) IS DEFECTIVE
BRAKE OPERATING LEVER (074) IS DEFECTIVE
ADJUST OR CHANGE
RUBBER PART OF REEL SUPPORT IS SOILED
CLEAN (WITH ALCOHOL) OR CHANGE
RUBBER PART OF FF ROLLER ASSEMBLY IS SOILED
CLEAN (WITH ALCOHOL) OR CHANGE
WINDING REEL SUPPORT SHAFT IS BENDING
ADJUST OR CHANGE
MOTOR (114) IS DEFECTIVE
CHANGE
MOTOR (114) DOES NOT REVOLVES
MOTOR SWITCH (SW-3) IS DEFECTIVE
ADJUST FOR CHANGE
MOTOR STARTING CAPACITOR (C607) IS DEFECTIVE
CHANGE
WINDING REEL SUPPORT (108) REVOLVES
WINDING TORQUE IS INSUFFICIENT
MOTOR PULLEY, FLYWHEEL, FF ROLLER ASSEMBLY BELTS SLIP DUE TO SOILING
CLEAN WITH ALCOHOL (USE SOFT CLOTH)
REED SUPPORT (108) DOES NOT REVOLVE SMOOTHLY
FF ROLLER ASSEMBLY (085) PRESSURE IS NOT PROPER
ADJUST OR CHANGE
BACK TENSION IS EXCESSIVE
BRAKE (088) IS DEFECTIVE
ADJUST OR CHANGE
INTERMEDIATE PULLEY (099) SHAFT IS BENDING
ADJUST OR CHANGE
INTERMEDIATE PULLEY DOES NOT REVOLVE SMOOTHLY
CLEAN OR CHANGE INTERMEDIATE PULLEY
FEED REEL SUPPORT SHAFT IS BENDING
ADJUST OR CHANGE
PAUSE OPERATION IS NOT NORMAL
PINCH ROLLER (101) DOES NOT STOP REVOLVING
PAUSE OPERATION LEVER (072) IS NOT PROPERLY ADJUSTED
ADJUST
TAKE-UP REEL (101) SUPPORT DOES NOT STOP REVOLVING
QUICK STOP ASSEMBLY (060) IS NOT PROPERLY ADJUSTED
PINCH ROLLER (101) AND TAKE-UP REEL SUPPORT DO NOT STOP SIMULTANEOUSLY

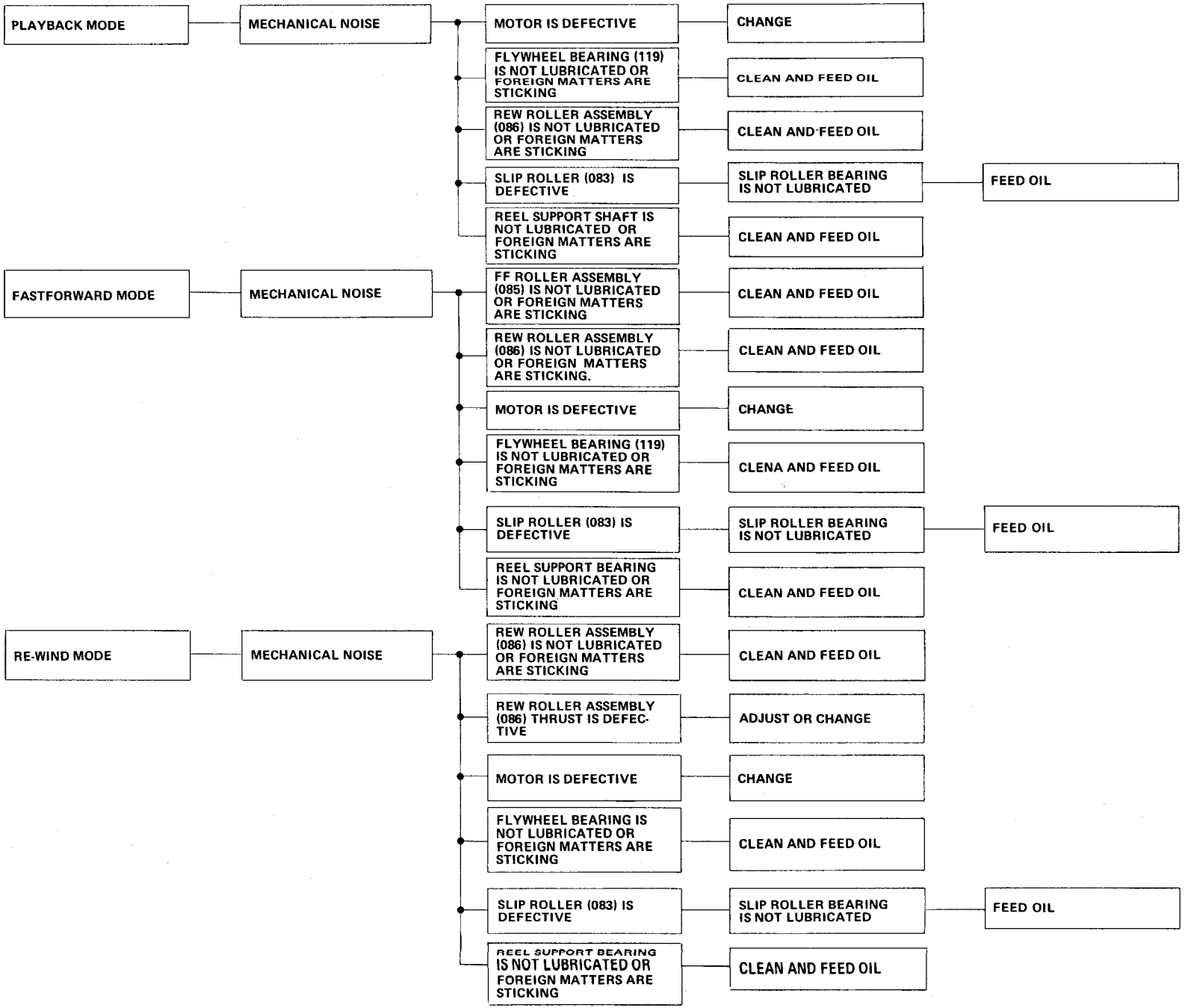
TROUBLE SHOOTING CHART OF MECHANISM (4)


RE-WINDING OPERATION IS DEFECTIVE
FEED REEL SUPPORT (107) DOES NOT REVOLVE
MOTOR (114) REVOLVES
REW ROLLER (086) ASSEMBLY PRESSURE IS INSUFFICIENT
PRESSING SPRING (159, 164) IS DEFECTIVE
ADJUST OR CHANGE
BRAKE (088) IS DEFECTIVE
BRAKE LEVER (074) IS DEFECTIVE
BRAKE OPERATING LEVER IS DEFECTIVE
ADJUST OR CHANGE
FEED REEL SUPPORT (107) BEARING IS DEFECTIVE
ADJUST OR CHANGE
REEL SUPPORT (107) RUBBER PART IS SOILED
CLEAN WITH ALCOHOL OR CHANGE
REW ROLLER ASSEMBLY (086) REVOLVING PART IS SOILED
CLEAN WITH ALCOHOL OR CHANGE
MOTOR (114) DOES NOT REVOLVE
SAME AS IN FF MODE
FEED REEL SUPPORT (107) REVOLVES
RE-WINDING TORQUE IS INSUFFICIENT
MOTOR PULLEY, FLYWHEEL BELTS SLIP DUE TO OIL STAINING
CLEAN WITH ALCOHOL (USE SOFT CLOTH)
REEL SUPPORT (107) DOES NOT REVOLVE SMOOTHLY
REW ROLLER ASSEMBLY (086) PRESSURE IS NOT PROPER
ADJUST OR CHANGE
BRAKE (088) IS DEFECTIVE
ADJUST OR CHANGE
BACK TENSION IS EXCESSIVE
WINDING REEL SUPPORT SHAFT IS BENDING
ADJUST OR CHANGE
WINDING REEL SUPPORT DOES NOT REVOLVE SMOOTHLY
CLEAN OR CHANGE

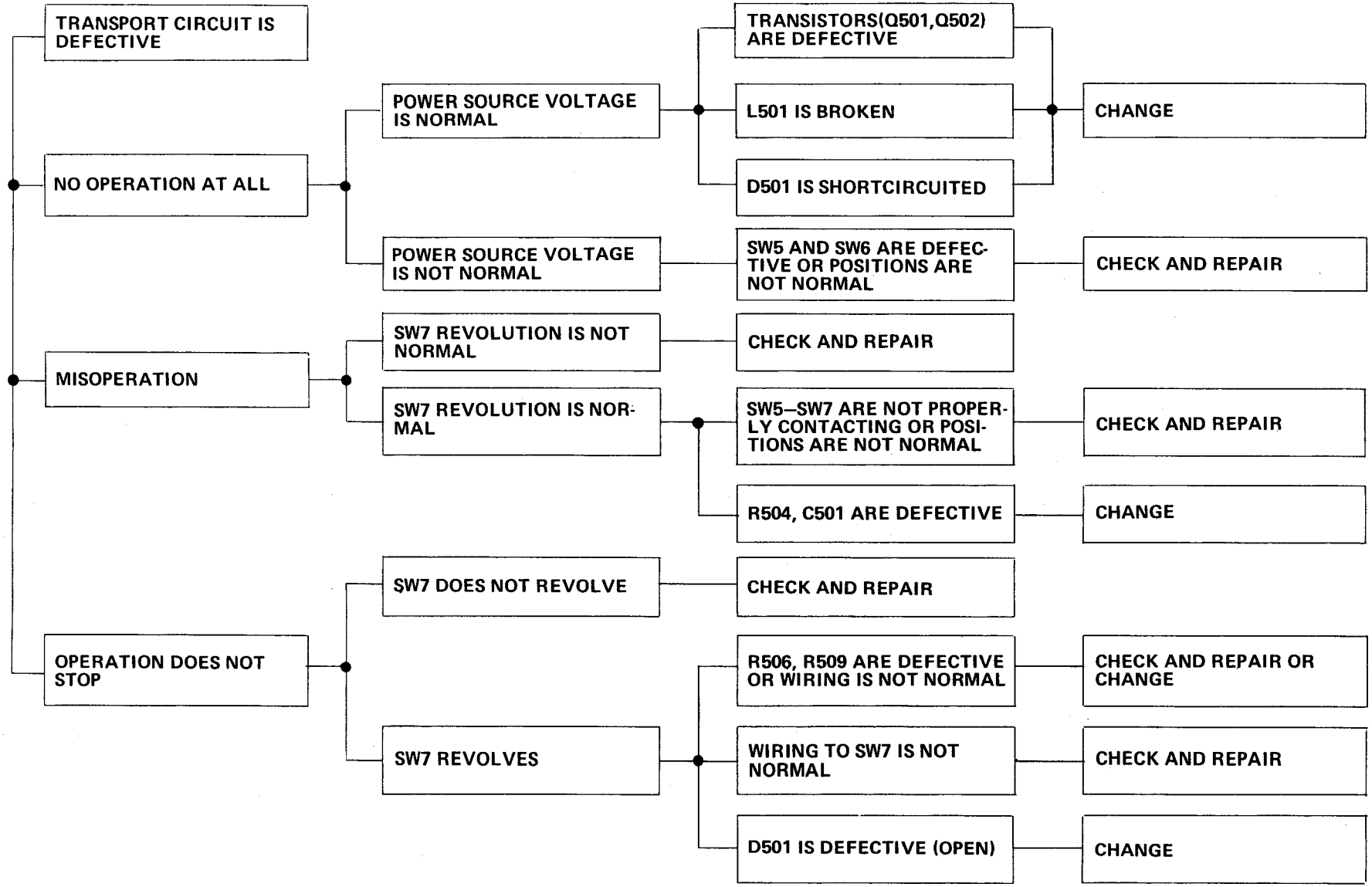
TROUBLE SHOOTING CHART OF MECHANISM (5)


STOP OPERATION DOES NOT WORK
MOTOR DOES NOT STOP
BRAKE OPERATING LEVER OPERATION IS NOT NORMAL
ADJUST OR CHANGE
MOTOR SWITCH (SW3) IS NOT PROPERLY ADJUSTED
ADJUST
AUTO SHUT OFF OPERATION DOES NOT NORMALLY WORK
TRANSPORT CIRCUIT DOES NOT WORK
TRANSPORT CIRCUIT IS DEFECTIVE
CIRCUIT TROUBLE CHART
TRANSPORT POWER SWITCH (SW5) DOES NOT OPERATE NORMALLY
ADJUST OR CHANGE
TRANSPORT POWER SWITCH (SW6) DOES NOT OPERATE NORMALLY
ADJUST OR CHANGE
TRANSPORT CIRCUIT IS WORKING
MOTOR TORQUE IS INSUF-FICIENT
MOTOR IS DEFECTIVE
CHANGE
MOTOR STARTING CAPACI CAPACITOR (C607) IS DEFEC-TIVE
CHANGE
COMMUTATOR SWITCH (SW7) IS DEFECTIVE
ADJUST OR CHANGE
STOP SOLENOID (L501) IS DEFECTIVE
CHANGE
SHUT-OFF MECHANISM IS DEFECTIVE
STOP LEVERS (082, 081, 080, 079) AND STOP RODS (098) ARE DEFECTIVE
ADJUST OR CHANGE
MOTOR SWITCH (SW3) IS NOT PROPERLY MOUNTED
ADJUST

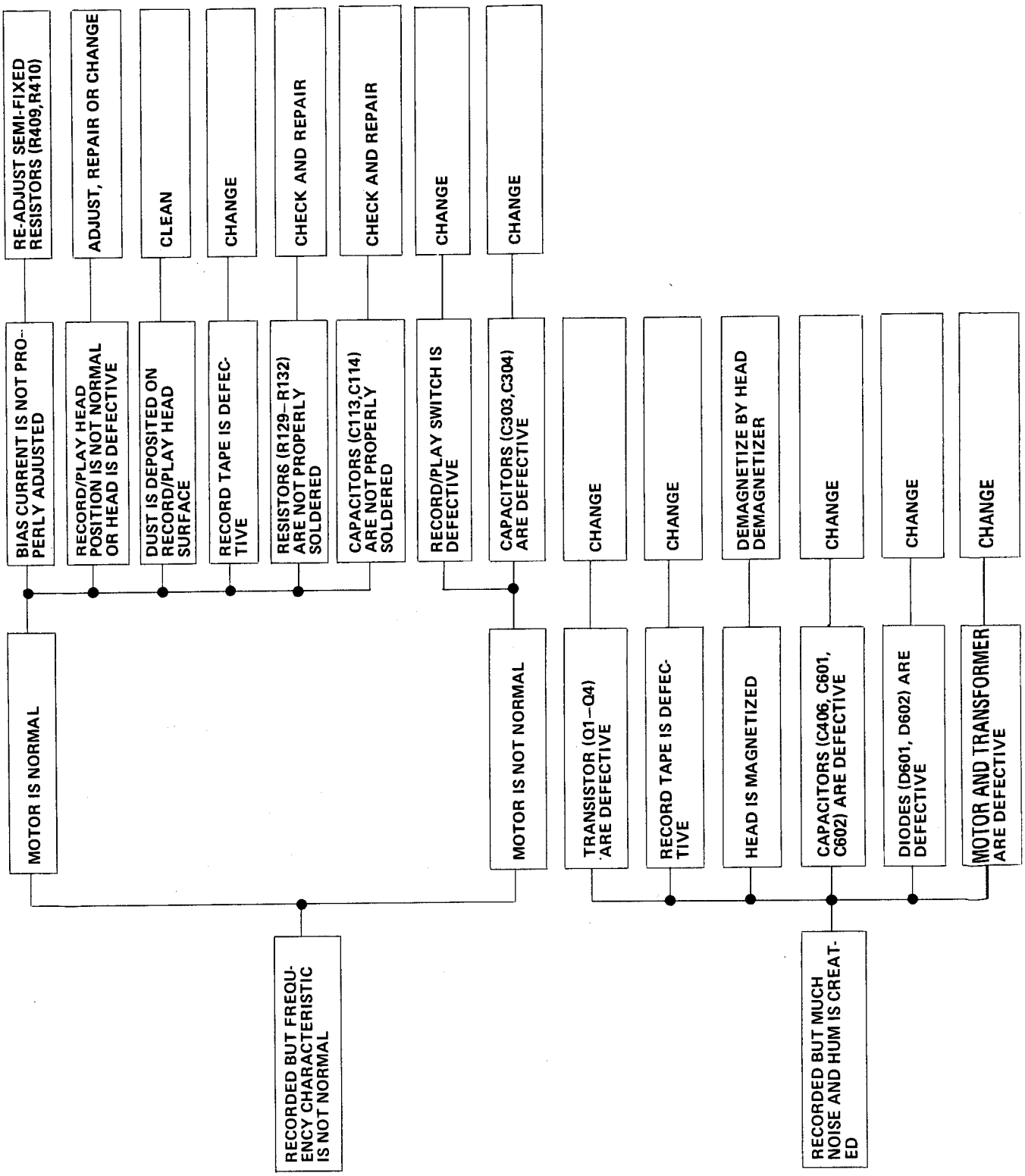
TROUBLE SHOOTING CHART OF MECHANISM (6)


PLAYBACK MODE
MECHANICAL NOISE
MOTOR IS DEFECTIVE
CHANGE
FLYWHEEL BEARING (119) IS NOT LUBRICATED OR FOREIGN MATTERS ARE STICKING
CLEAN AND FEED OIL
REW ROLLER ASSEMBLY (086) IS NOT LUBRICATED OR FOREIGN MATTERS ARE STICKING
CLEAN AND FEED OIL
SLIP ROLLER (083) IS DEFECTIVE
SLIP ROLLER BEARING IS NOT LUBRICATED
FEED OIL
REEL SUPPORT SHAFT IS NOT LUBRICATED OR FOREIGN MATTERS ARE STICKING
CLEAN AND FEED OIL
FASTFORWARD MODE
MECHANICAL NOISE
FF ROLLER ASSEMBLY (085) IS NOT LUBRICATED OR FOREIGN MATTERS ARE STICKING
CLEAN AND FEED OIL
REW ROLLER ASSEMBLY (086) IS NOT LUBRICATED OR FOREIGN MATTERS ARE STICKING.
CLEAN AND FEED OIL
MOTOR IS DEFECTIVE
CHANGE
FLYWHEEL BEARING (119) IS NOT LUBRICATED OR FOREIGN MATTERS ARE STICKING
CLENA AND FEED OIL
SLIP ROLLER (083) IS DEFECTIVE
SLIP ROLLER BEARING IS NOT LUBRICATED
FEED OIL
REEL SUPPORT BEARING IS NOT LUBRICATED OR FOREIGN MATTERS ARE STICKING
CLEAN AND FEED OIL
RE-WIND MODE
MECHANICAL NOISE
REW ROLLER ASSEMBLY (086) IS NOT LUBRICATED OR FOREIGN MATTERS ARE STICKING
CLEAN AND FEED OIL
REW ROLLER ASSEMBLY (086) THRUST IS DEFECTIVE
ADJUST OR CHANGE
MOTOR IS DEFECTIVE
CHANGE
FLYWHEEL BEARING IS NOT LUBRICATED OR FOREIGN MATTERS ARE STICKING
CLEAN AND FEED OIL
SLIP ROLLER (083) IS DEFECTIVE
SLIP ROLLER BEARING IS NOT LUBRICATED
FEED OIL
REEL SUPPORT BEARING IS NOT LUBRICATED OR FOREIGN MATTERS ARE STICKING
CLEAN AND FEED OIL

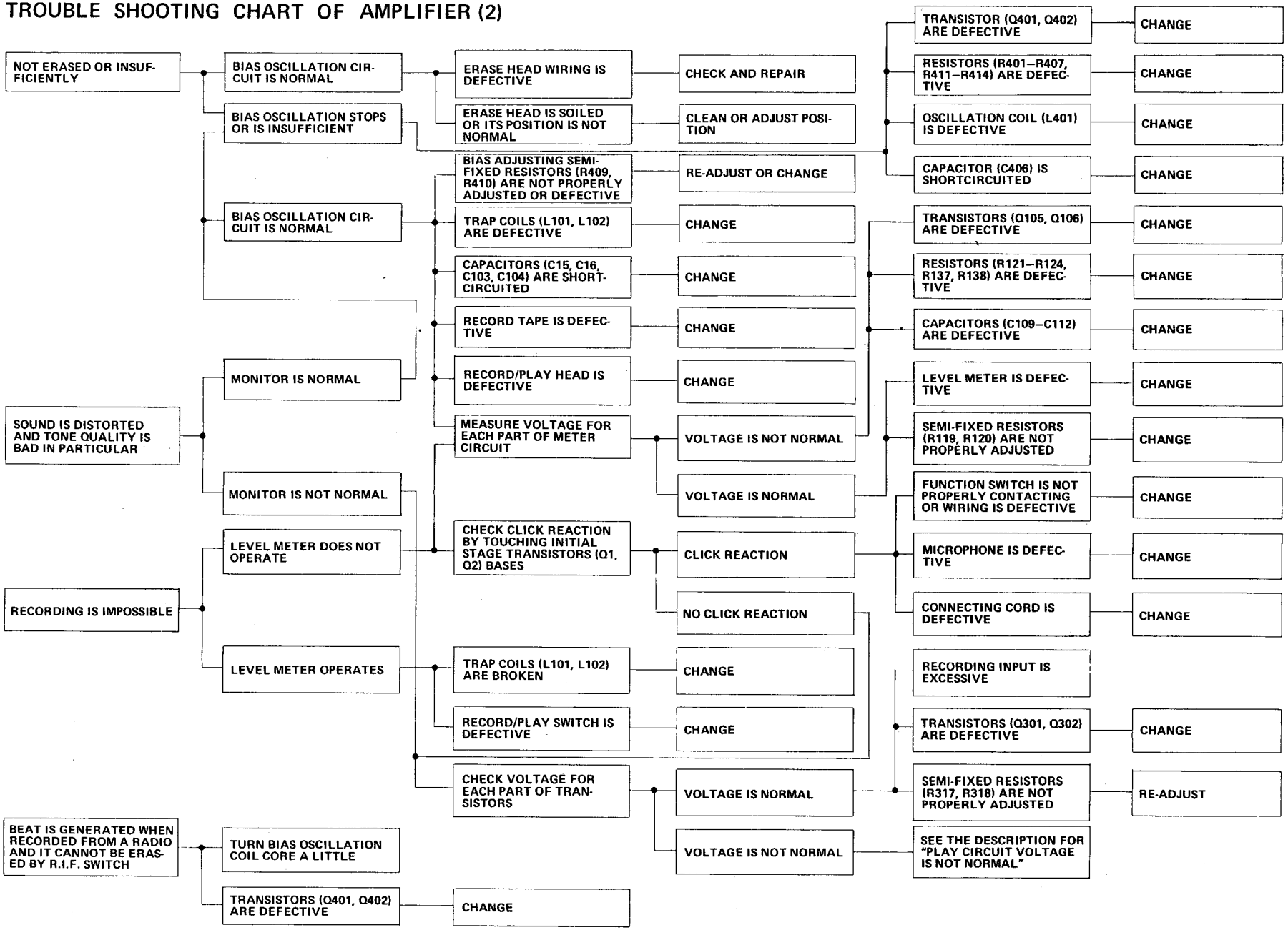
CIRCUIT TROUBLE CHART A


TRANSPORT CIRCUIT IS DEFECTIVE
NO OPERATION AT ALL
POWER SOURCE VOLTAGE IS NORMAL
TRANSISTORS(Q501,Q502) ARE DEFECTIVE
L501 IS BROKEN
D501 IS SHORTCIRCUITED
CHANGE
POWER SOURCE VOLTAGE IS NOT NORMAL
SW5 AND SW6 ARE DEFECTIVE OR POSITIONS ARE NOT NORMAL
CHECK AND REPAIR
MISOPERATION
SW7 REVOLUTION IS NOT NORMAL
CHECK AND REPAIR
SW7 REVOLUTION IS NORMAL
SW5–SW7 ARE NOT PROPERLY CONTACTING OR POSITIONS ARE NOT NORMAL
CHECK AND REPAIR
R504, C501 ARE DEFECTIVE
CHANGE
OPERATION DOES NOT STOP
SW7 DOES NOT REVOLVE
CHECK AND REPAIR
SW7 REVOLVES
R506, R509 ARE DEFECTIVE OR WIRING IS NOT NORMAL
CHECK AND REPAIR OR CHANGE
WIRING TO SW7 IS NOT NORMAL
CHECK AND REPAIR
D501 IS DEFECTIVE (OPEN)
CHANGE

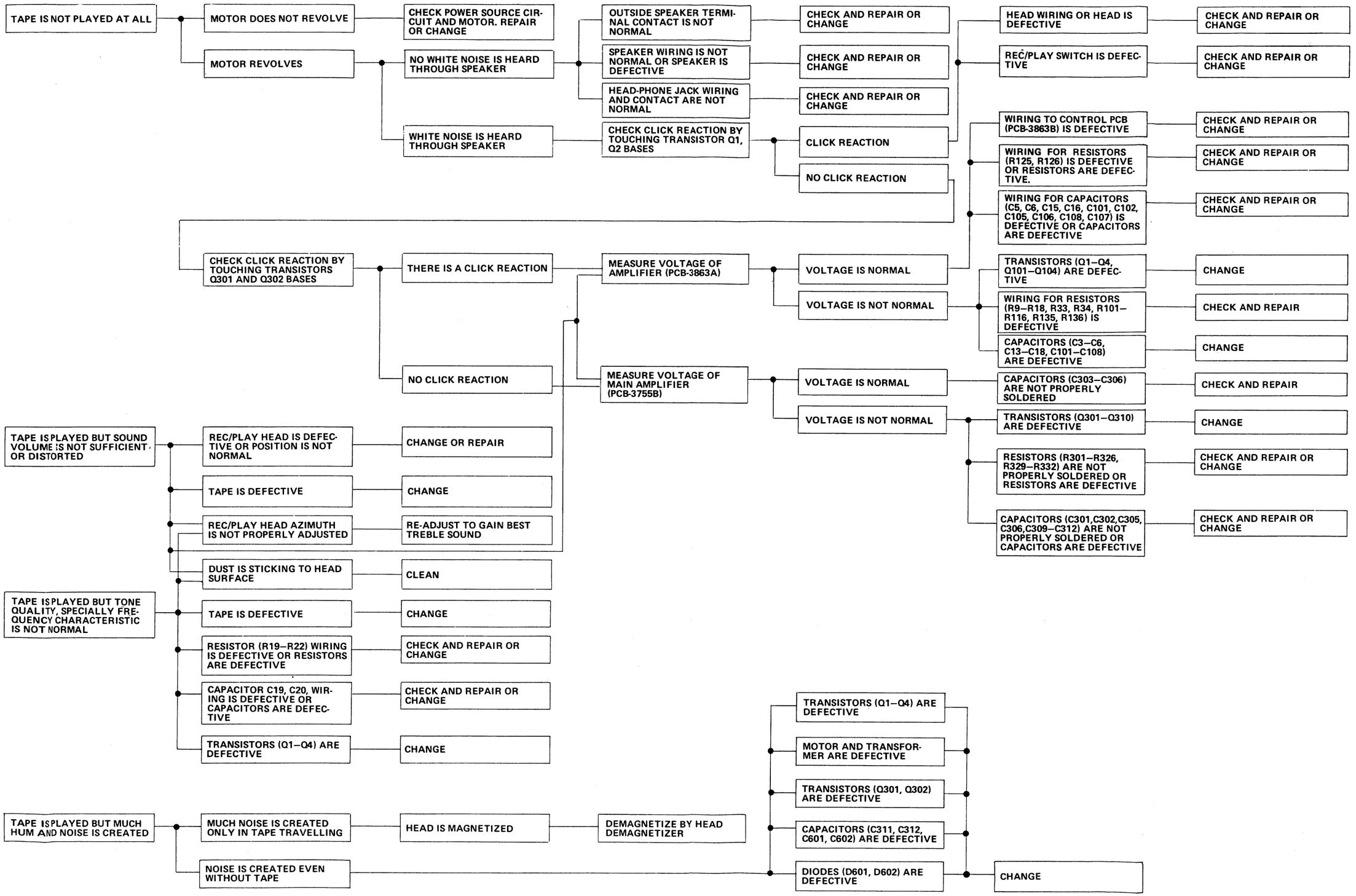
TROUBLE SHOOTING CHART OF AMPLIFIER (1)



TROUBLE SHOOTING CHART OF AMPLIFIER (2)


NOT ERASED OR INSUFFICIENTLY
BIAS OSCILLATION CIRCUIT IS NORMAL
ERASE HEAD WIRING IS DEFECTIVE
CHECK AND REPAIR
ERASE HEAD IS SOILED OR ITS POSITION IS NOT NORMAL
CLEAN OR ADJUST POSITION
BIAS OSCILLATION STOPS OR IS INSUFFICIENT
BIAS ADJUSTING SEMI-FIXED RESISTORS (R409, R410) ARE NOT PROPERLY ADJUSTED OR DEFECTIVE
RE-ADJUST OR CHANGE
BIAS OSCILLATION CIRCUIT IS NORMAL
TRAP COILS (L101, L102) ARE DEFECTIVE
CHANGE
CAPACITORS (C15, C16, C103, C104) ARE SHORT-CIRCUITED
CHANGE
RECORD TAPE IS DEFECTIVE
CHANGE
SOUND IS DISTORTED AND TONE QUALITY IS BAD IN PARTICULAR
MONITOR IS NORMAL
RECORD/PLAY HEAD IS DEFECTIVE
CHANGE
MEASURE VOLTAGE FOR EACH PART OF METER CIRCUIT
VOLTAGE IS NOT NORMAL
VOLTAGE IS NORMAL
MONITOR IS NOT NORMAL
CHECK CLICK REACTION BY TOUCHING INITIAL STAGE TRANSISTORS (Q1, Q2) BASES
CLICK REACTION
NO CLICK REACTION
LEVEL METER DOES NOT OPERATE
RECORDING IS IMPOSSIBLE
LEVEL METER OPERATES
TRAP COILS (L101, L102) ARE BROKEN
CHANGE
RECORD/PLAY SWITCH IS DEFECTIVE
CHANGE
CHECK VOLTAGE FOR EACH PART OF TRANSISTORS
VOLTAGE IS NORMAL
VOLTAGE IS NOT NORMAL
BEAT IS GENERATED WHEN RECORDED FROM A RADIO AND IT CANNOT BE ERASED BY R.I.F. SWITCH
TURN BIAS OSCILLATION COIL CORE A LITTLE
TRANSISTORS (Q401, Q402) ARE DEFECTIVE
CHANGE
TRANSISTOR (Q401, Q402) ARE DEFECTIVE
CHANGE
RESISTORS (R401–R407, R411–R414) ARE DEFECTIVE
CHANGE
OSCILLATION COIL (L401) IS DEFECTIVE
CHANGE
CAPACITOR (C406) IS SHORTCIRCUITED
CHANGE
TRANSISTORS (Q105, Q106) ARE DEFECTIVE
CHANGE
RESISTORS (R121–R124, R137, R138) ARE DEFECTIVE
CHANGE
CAPACITORS (C109–C112) ARE DEFECTIVE
CHANGE
LEVEL METER IS DEFECTIVE
CHANGE
SEMI-FIXED RESISTORS (R119, R120) ARE NOT PROPERLY ADJUSTED
CHANGE
FUNCTION SWITCH IS NOT PROPERLY CONTACTING OR WIRING IS DEFECTIVE
CHANGE
MICROPHONE IS DEFECTIVE
CHANGE
CONNECTING CORD IS DEFECTIVE
CHANGE
RECORDING INPUT IS EXCESSIVE
TRANSISTORS (Q301, Q302) ARE DEFECTIVE
CHANGE
SEMI-FIXED RESISTORS (R317, R318) ARE NOT PROPERLY ADJUSTED
RE-ADJUST
SEE THE DESCRIPTION FOR "PLAY CIRCUIT VOLTAGE IS NOT NORMAL"

TROUBLE SHOOTING OF AMPLIFIER (3)


TAPE IS NOT PLAYED AT ALL
MOTOR DOES NOT REVOLVE
CHECK POWER SOURCE CIRCUIT AND MOTOR. REPAIR OR CHANGE
MOTOR REVOLVES
NO WHITE NOISE IS HEARD THROUGH SPEAKER
OUTSIDE SPEAKER TERMINAL CONTACT IS NOT NORMAL
CHECK AND REPAIR OR CHANGE
SPEAKER WIRING IS NOT NORMAL OR SPEAKER IS DEFECTIVE
CHECK AND REPAIR OR CHANGE
HEAD-PHONE JACK WIRING AND CONTACT ARE NOT NORMAL
CHECK AND REPAIR OR CHANGE
WHITE NOISE IS HEARD THROUGH SPEAKER
CHECK CLICK REACTION BY TOUCHING TRANSISTOR Q1, Q2 BASES
CLICK REACTION
NO CLICK REACTION
HEAD WIRING OR HEAD IS DEFECTIVE
CHECK AND REPAIR OR CHANGE
REC/PLAY SWITCH IS DEFECTIVE
CHECK AND REPAIR OR CHANGE
WIRING TO CONTROL PCB (PCB-3863B) IS DEFECTIVE
CHECK AND REPAIR OR CHANGE
WIRING FOR RESISTORS (R125, R126) IS DEFECTIVE OR RESISTORS ARE DEFECTIVE.
CHECK AND REPAIR OR CHANGE
WIRING FOR CAPACITORS (C5, C6, C15, C16, C101, C102, C105, C106, C108, C107) IS DEFECTIVE OR CAPACITORS ARE DEFECTIVE
CHECK AND REPAIR OR CHANGE
CHECK CLICK REACTION BY TOUCHING TRANSISTORS Q301 AND Q302 BASES
THERE IS A CLICK REACTION
MEASURE VOLTAGE OF AMPLIFIER (PCB-3863A)
VOLTAGE IS NORMAL
TRANSISTORS (Q1–Q4, Q101–Q104) ARE DEFECTIVE
CHANGE
VOLTAGE IS NOT NORMAL
WIRING FOR RESISTORS (R9–R18, R33, R34, R101–R116, R135, R136) IS DEFECTIVE
CHECK AND REPAIR
CAPACITORS (C3–C6, C13–C18, C101–C108) ARE DEFECTIVE
CHANGE
NO CLICK REACTION
MEASURE VOLTAGE OF MAIN AMPLIFIER (PCB-3755B)
VOLTAGE IS NORMAL
CAPACITORS (C303–C306) ARE NOT PROPERLY SOLDERED
CHECK AND REPAIR
VOLTAGE IS NOT NORMAL
TRANSISTORS (Q301–Q310) ARE DEFECTIVE
CHANGE
RESISTORS (R301–R326, R329–R332) ARE NOT PROPERLY SOLDERED OR RESISTORS ARE DEFECTIVE
CHECK AND REPAIR OR CHANGE
CAPACITORS (C301,C302,C305, C306,C309–C312) ARE NOT PROPERLY SOLDERED OR CAPACITORS ARE DEFECTIVE
CHECK AND REPAIR OR CHANGE
TAPE IS PLAYED BUT SOUND VOLUME IS NOT SUFFICIENT OR DISTORTED
REC/PLAY HEAD IS DEFECTIVE OR POSITION IS NOT NORMAL
CHANGE OR REPAIR
TAPE IS DEFECTIVE
CHANGE
REC/PLAY HEAD AZIMUTH IS NOT PROPERLY ADJUSTED
RE-ADJUST TO GAIN BEST TREBLE SOUND
DUST IS STICKING TO HEAD SURFACE
CLEAN
TAPE IS PLAYED BUT TONE QUALITY, SPECIALLY FREQUENCY CHARACTERISTIC IS NOT NORMAL
TAPE IS DEFECTIVE
CHANGE
RESISTOR (R19–R22) WIRING IS DEFECTIVE OR RESISTORS ARE DEFECTIVE
CHECK AND REPAIR OR CHANGE
CAPACITOR C19, C20, WIRING IS DEFECTIVE OR CAPACITORS ARE DEFECTIVE
CHECK AND REPAIR OR CHANGE
TRANSISTORS (Q1–Q4) ARE DEFECTIVE
CHANGE
TAPE IS PLAYED BUT MUCH HUM AND NOISE IS CREATED
MUCH NOISE IS CREATED ONLY IN TAPE TRAVELLING
HEAD IS MAGNETIZED
DEMAGNETIZE BY HEAD DEMAGNETIZER
NOISE IS CREATED EVEN WITHOUT TAPE
TRANSISTORS (Q1–Q4) ARE DEFECTIVE
MOTOR AND TRANSFORMER ARE DEFECTIVE
TRANSISTORS (Q301, Q302) ARE DEFECTIVE
CAPACITORS (C311, C312, C601, C602) ARE DEFECTIVE
DIODES (D601, D602) ARE DEFECTIVE
CHANGE

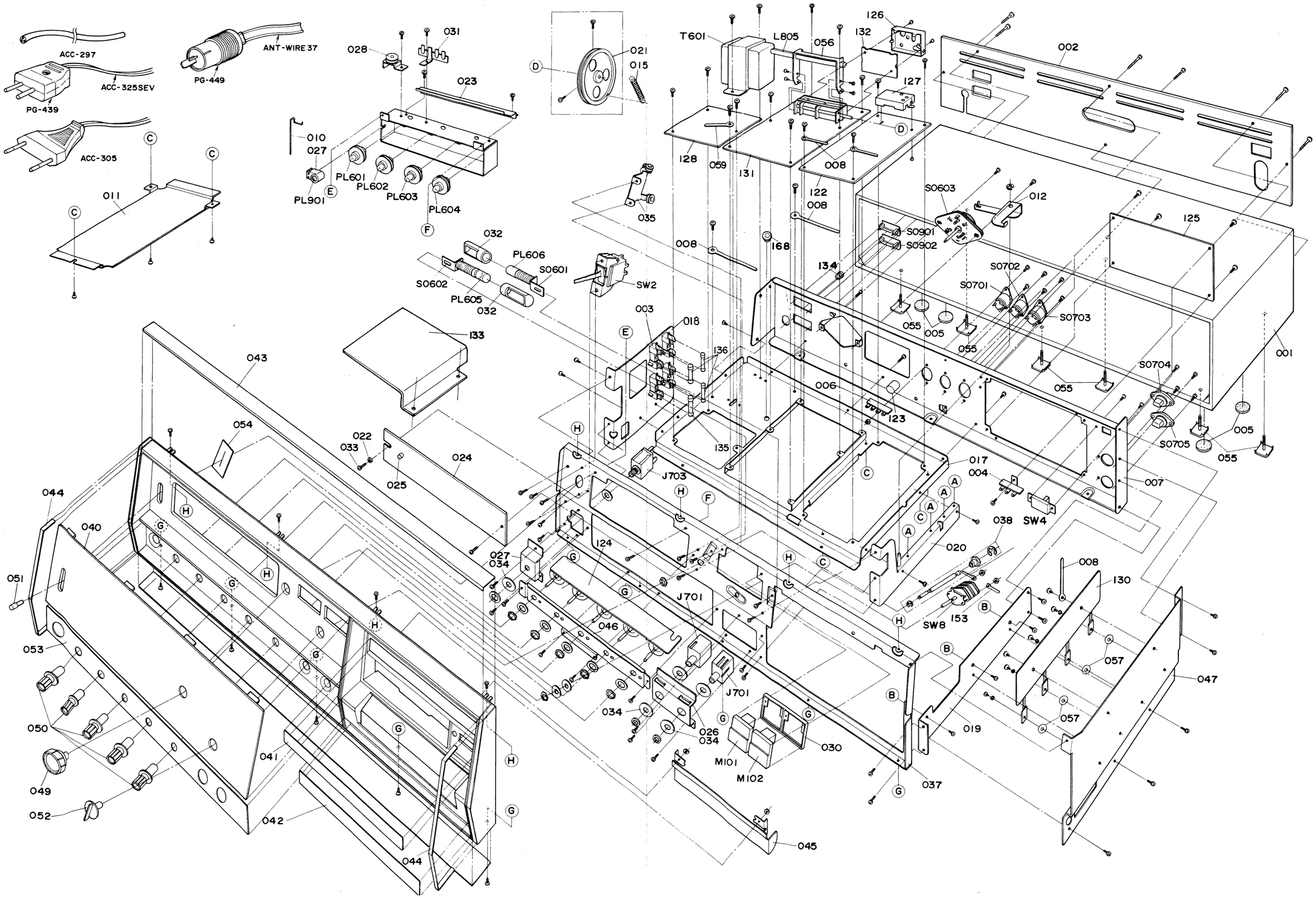


Figure 50 CABINET EXPLODED VIEW

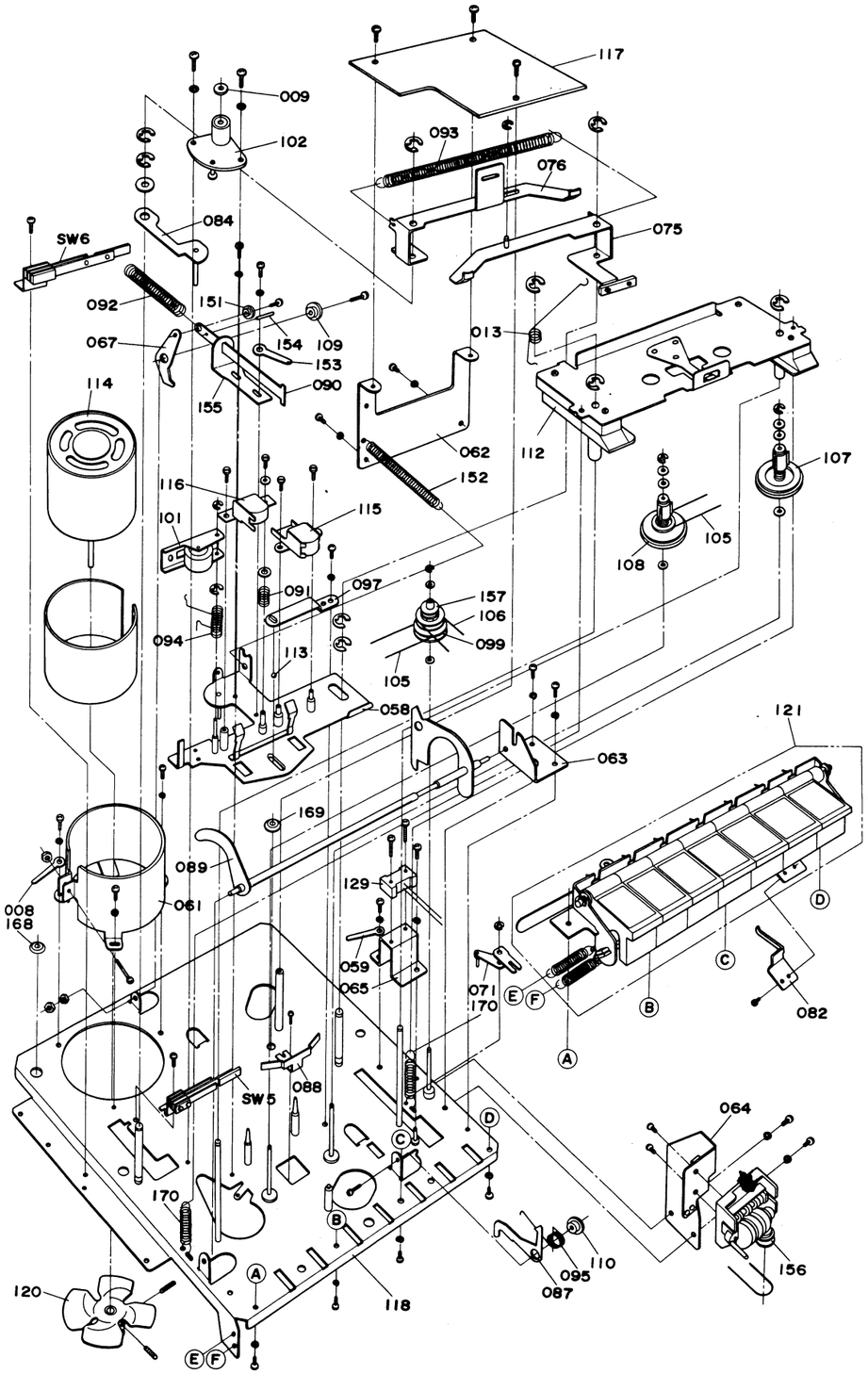


Figure 51 MECHANISM EXPLODED TOP VIEW

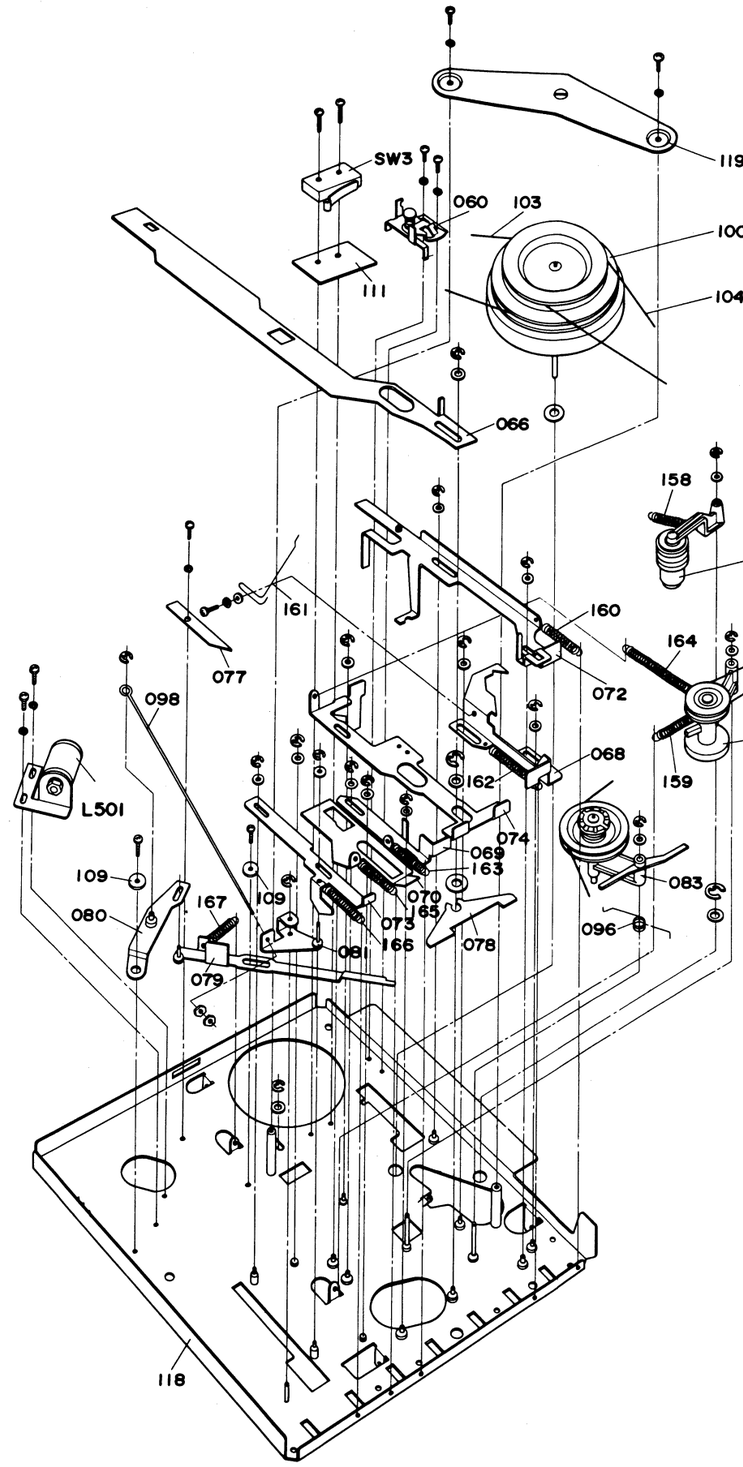


Figure 52 MECHANISM EXPLODED BOTTOM VIEW

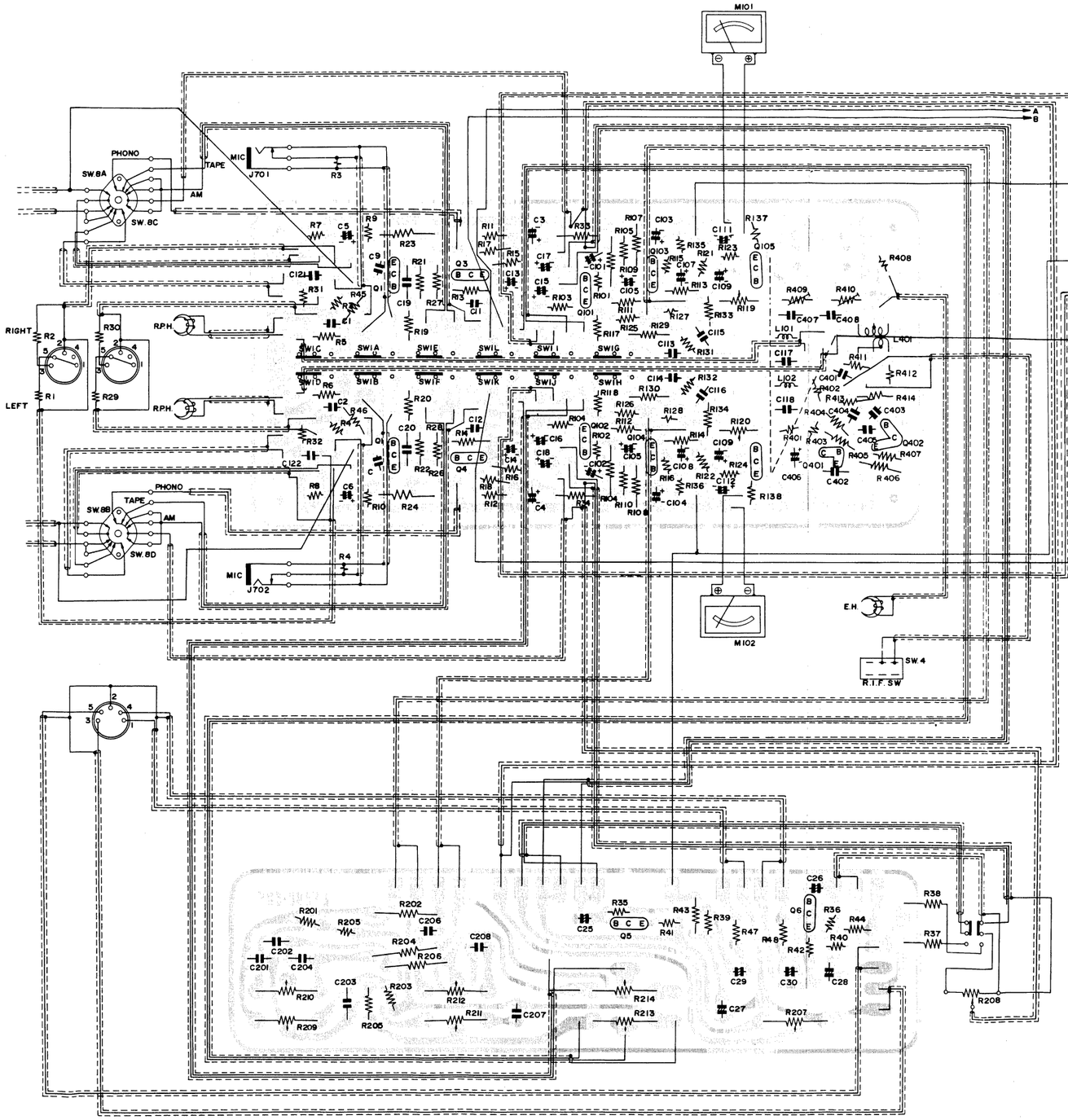


Figure 53 PRE AMP/MAIN AMP/CONTROL BOARD WIRING SIDE

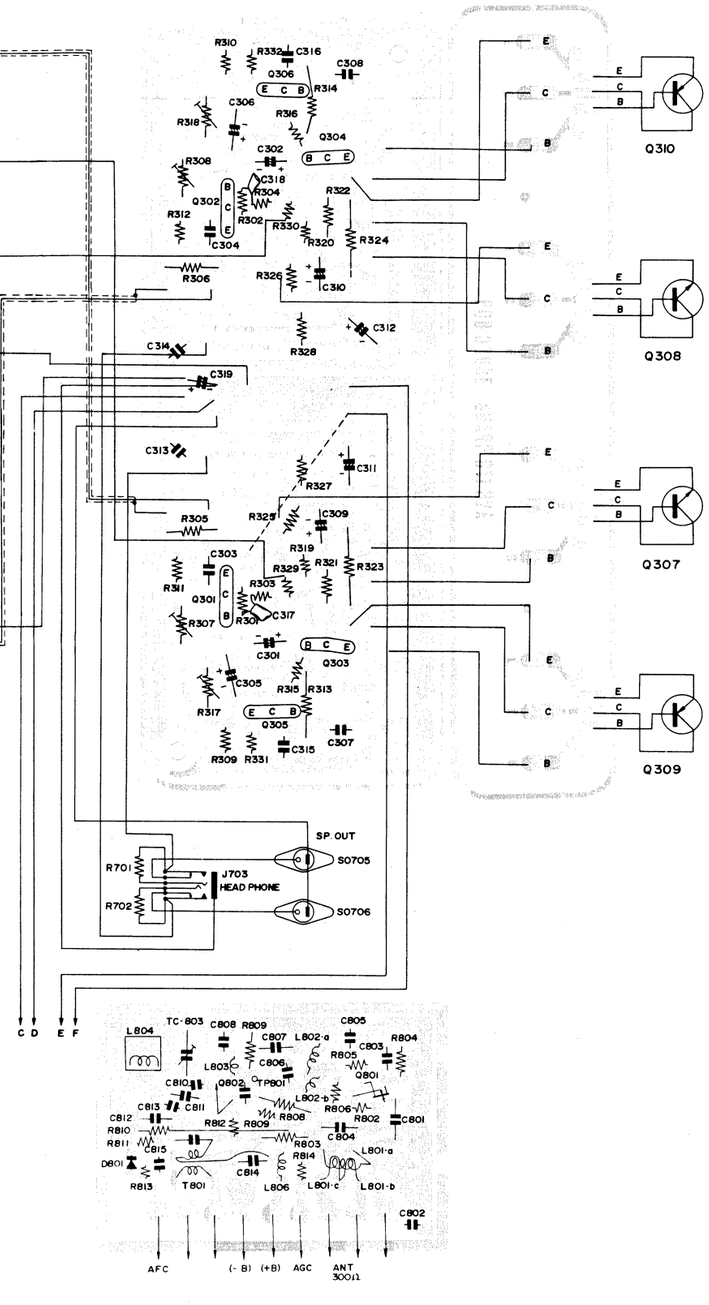


Figure 54 FM TUNER BOARD WIRING SIDE

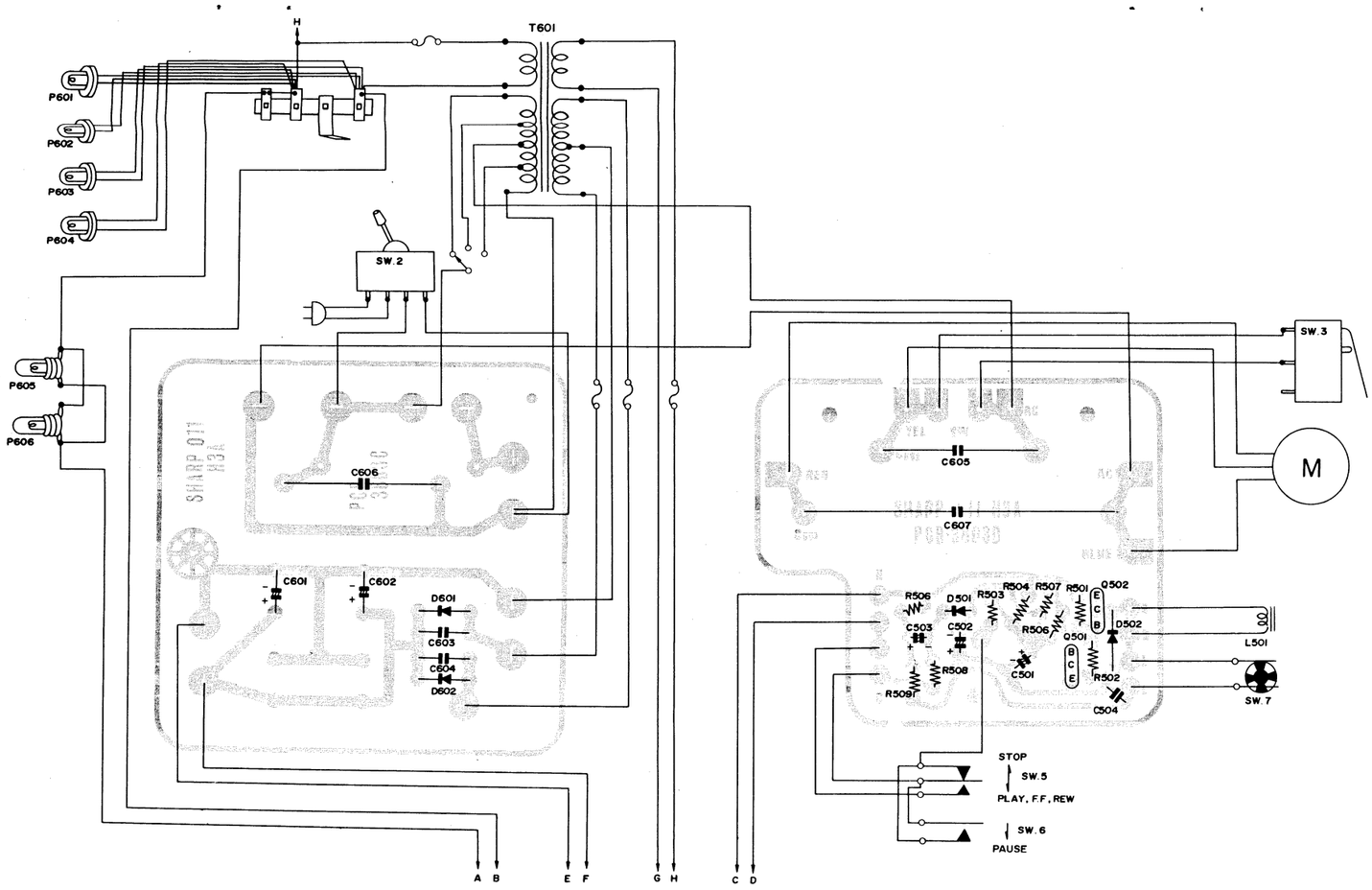


Figure 55 POWER/TRANSPORT BOARD WIRING SIDE

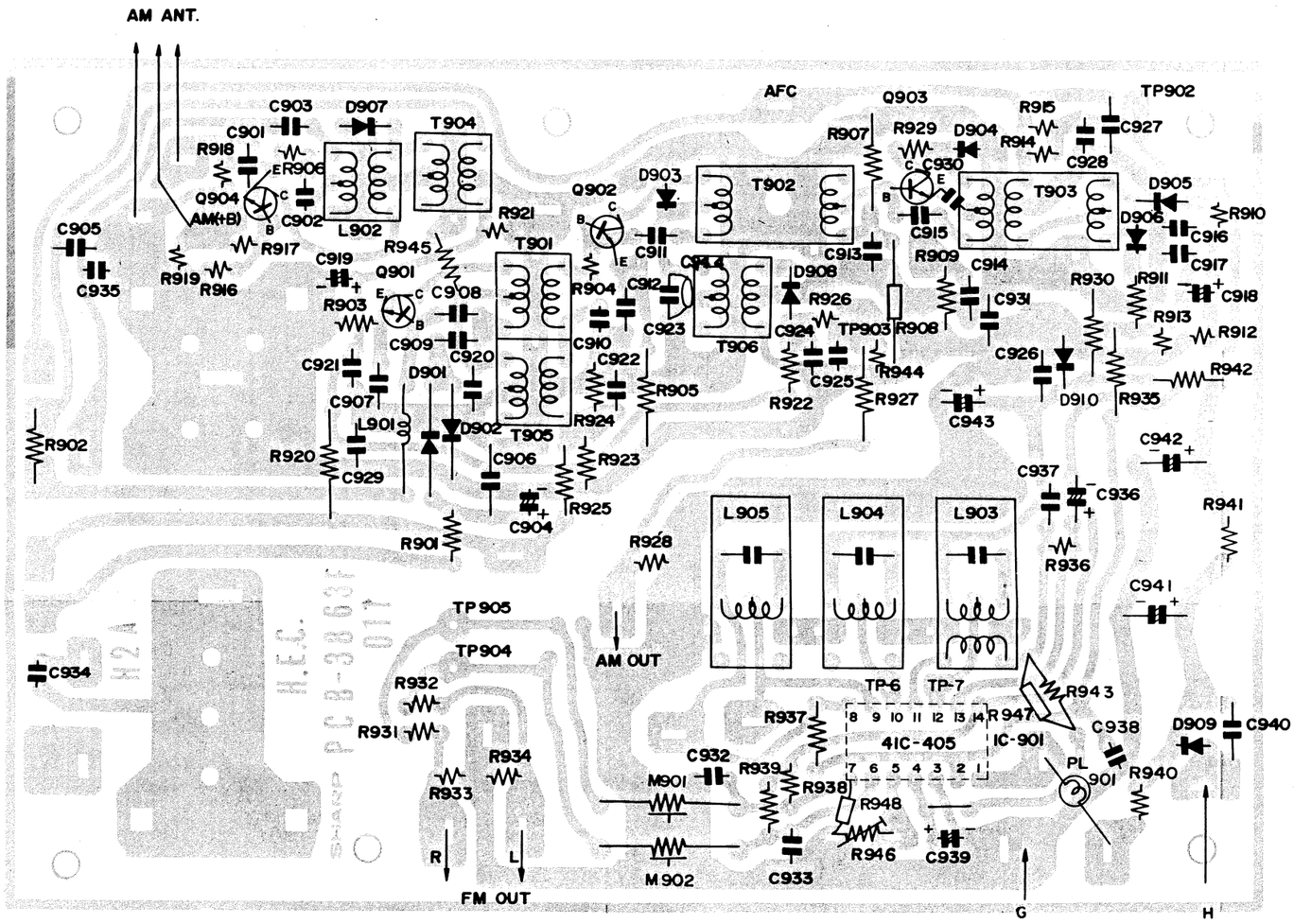


Figure 56 AM TUNER/IF/MPX BOARD WIRING WIDE

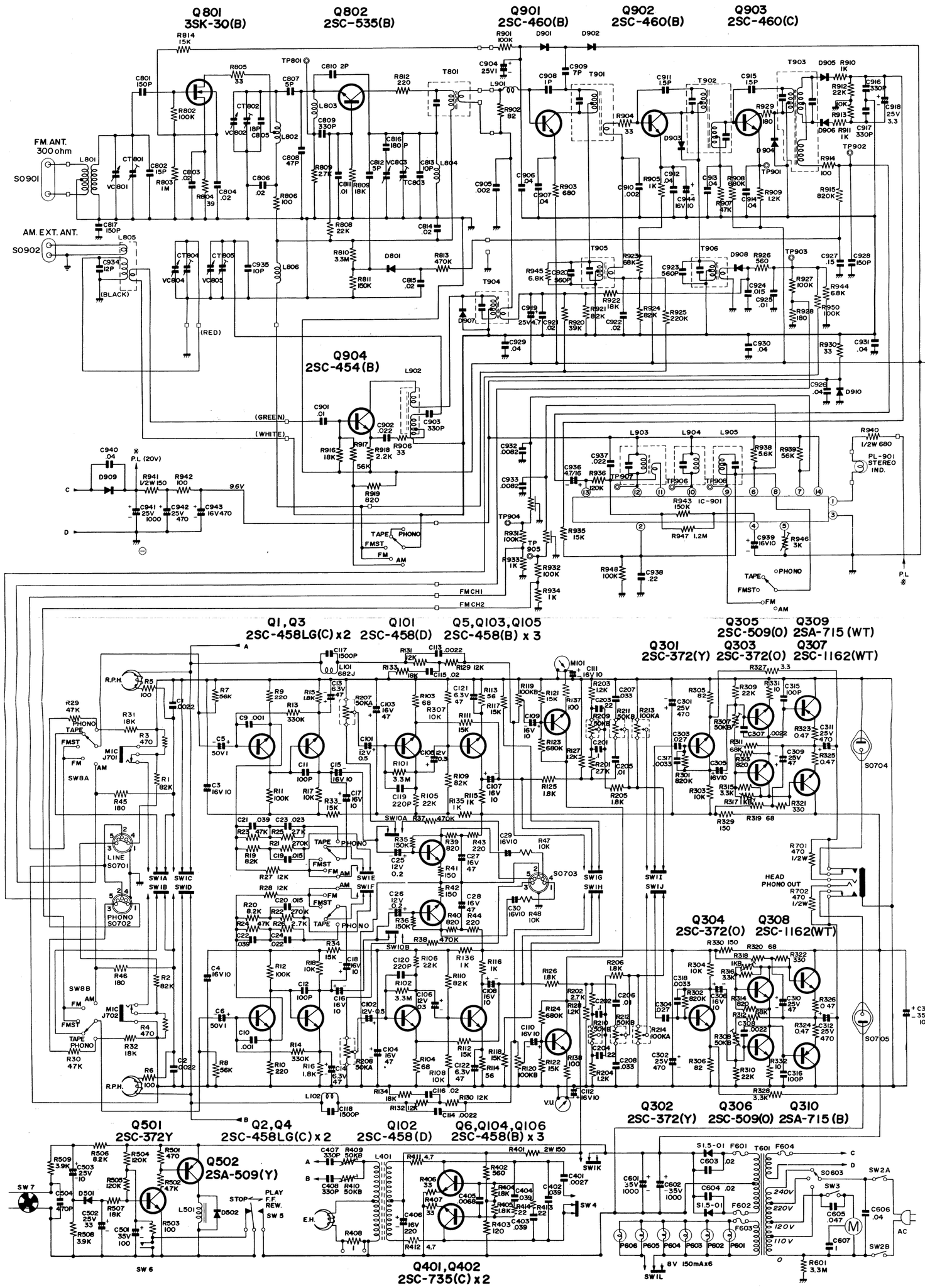
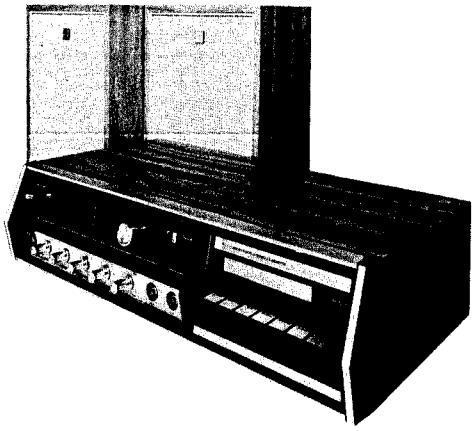


Figure 57 SCHEMATIC DIAGRAM

PARTS LIST



MODELS

SC-103H

CP-108H

REF.NO.	PART NO.	DESCRIPTION	
1	2CAB-3863A	Cabinet	
2	U-FUTA3867	Rear Plate, Center Box	
3	FH-127	Fuse Holder	
4	LG-209	Lug, Line Antenna	
5	FELT-3755	Felt, Leg	
6	LG-989	Lug, 3 Pin	
7	XJ-ANG3867	Bracket, Jack	
8	WH-1	Wire Holder	
9	OIL-C-3543	Washer, Oil Cut	
10	SISIN-3843	Pointer, Dial	
11	SILD-3863B	Plate, Shield	
12	PB-LEV3863	Lever, Record/Playback	
13	D-LOCK3863	Lock, Door	
14	BANE-3863G	Spring, Door	
15	SPRING	Spring, Dial Cord	
17	X6AMPC3863	Chassis, Amplifier	
18	XLENK3867A	Bracket	
19	XLENK3863B	Bracket	
20	XLENK3863C	Bracket	
21	XDP-415	Drum, Tuning	
22	GOMUSPACER	Spacer, Rubber	
23	SISIN-COV	Cover, Pointer	
24	DIAL-3867	Dial Plate	
25	PL-DEC-COV	Cover, FM STEREO Indicator	
26	MIC-A3863	Bracket, Microphone Jack	
27	H-P-A3863	Bracket, Headphone Jack	
28	P-ANG3863B	Bracket, Pulley	
29	PL-HOL3863	Holder, FM STEREO Indicator	
30	M-GOMU3863	Holder, Meter	
31	LG-301	Lug, Pilot Lead Wire	
32	PC-449	Cover, Pilot	
33	X3TOK-10	Screw, 3ϕ x 10mm	
34	SPACER 911B	Spacer, MIC Jack	
35	XP-A3863A	Bracket, Pulley	
36	XS-COV3863	Cover, Dial	
37	XVR-A3863A	Bracket, Volume	
38	XDS-522	Shaft, Tuning	
39	PANEL3863A	Panel, Front	
40	PANEL3863B	Panel, Smoked	
41	IND-P3863B	Indication Plate, Upper	
42	IND-P3863C	Indication Plate, Lower	
43	DEC-M3863A	Decoration Panel, Upper & Lower	
44	DEC-M3863B	Decoration Panel, Left & Right	

REF.NO.	PART NO.	DESCRIPTION	
45	DOOR-C3867	Door, Cassette Insert	
46	VR-A3863B	Bracket, Volume Control	
47	XHONE-3863	Plate, Heat Sink	
49	8K-468	Knob, Tuning	
50	8K-470	Knob, Volume	
51	8K-438	Knob, Power	
52	9K-440	Knob,, Mode Selector	
53	IND-P3867A	Indication Panel	
54	SHEET-456	Felt, Power Switch	
55	X4TOKW+18S	Screw, 4ϕx18mm, Special	
56	CH-106	Holder, Core	
57	SK-18A	Spacer, Power Transistor	
58	X6SC-3863	Sub-chassis	
59	WH-12	Wire Holder	
60	QS-ASSY	Pause Mechanism Assembly	
61	M-ANG3863	Holder, Motor	
62	ANG-3863C	Bracket, Transport	
63	ANG-3863D	Bracket, Eject Arm	
64	ANG-3863E	Bracket, Counter	
65	ANG-3863F	Bracket, Pause Switch	
66	LEV-3863A	Lever, Play Operation	
67	LEV-3863B	Lever, Play Operation	
68	LEV-3863C	Lever, Fast Forward	
69	LEV-3863D	Lever, Rewind	
70	LEV-3863E	Lever, Record	
71	LEV-3863F	Lever, Record	
72	LEV-3863G	Lever, Pause	
73	LEV-3863H	Lever, Eject	
74	LEV-3863I	Lever, Brake	
75	LEV-3863J	Lever, Cassette Thrust	
76	LEV-3863K	Lever, Cassette Thrust	
77	LEV-3863L	Lever, Stop Lever Adjust	
78	LEV-3863M	Lever, Fast Forward Safety	
79	STOP-LEV-A	Lever, Stopping	
80	STOP-LEV-B	Lever, Stopping	
81	STOP-LEV-C	Lever, Stopping	
82	STOP-LEV-D	Lever, Stopping	
83	S-R-ASSY	Slip Roller Assembly	
84	FF-LEV-A	Lever, Fast Forward Roller	
85	FF-R-ASSY	Lever, Fast Forward Roller	
86	REW-R-ASSY	Rewind Roller Assembly	
87	FOOL-P3863	Record Safety Lever	
88	BK-LEV3863	Lever, Brake	
89	EJ-ARM-ASY	Eject Arm Assembly	
90	LEV-3863Q	Lever, Pressure	

REF.NO.	PART NO.	DESCRIPTION	
91	BANE-3009H	Spring, Azimuth	
92	SPR-3863N	Spring, Over Stroke	
93	SPR-3863P	Spring, Cassette Thrust	
94	SPR-3863R	Spring, Pressure Roller	
95	SPR-3863S	Spring, Record Safety Lever	
96	SPR-3863T	Spring, Slip Roller Lever	
97	BANE-3863C	Spring, Sub-Chassis Retaining	
98	ROD-3863A	Rod, Stopping	
99	PULY-3863A	Pulley, Intermediate	
100	FLY-3863	Flywheel Assembly	
101	P-R-3543	Pressure Roller Lever Assembly	
102	METAL-3863A	Metal Capstan	
103	BELT-3863A	Belt, Driving	
104	BELT-3863B	Belt, Driving	
105	BELT-3863C	Belt, Counter	
106	BELT-3863D	Belt, Counter	
107	R-DAI 3863A	Turntable, Supply	
108	R-DAI 3863B	Turntable, Take-Up	
109	SPACE 3863A	Spacer, Stop Lever	
110	SPACE 3863B	Record Safety Lever	
111	SW-COV 3863	Fiber, Switch	
112	CS-H-3863	Cassette Holder	
113	BALL	Ball	
114	MOTOR-3863	Motor	
115	HEAD-3265B	Head, Erase	
116	HEAD-3473A	Head, Record/Playback	
117	UNIT-3863H	Printed Circuit, Transport	
118	X6MC-3863	Chassis, Mechanism	
119	XFLY-A2863	Bracket, Flywheel	
120	XPULY 3867B	Pulley, Motor	
121	XB-ASY3863	Push Buttons Assembly	
122	UNIT-3867A,BE	Printed Circuit, Record/Playback	
123	GOMU-3863	Spacer, Rubber	
124	UNIT-3867A	Printed Circuit, Control	
125	UNIT-3867D	Printed Circuit, Power	
126	SHIELD-COV	Case, Shield, Tuner	
127	XSLD-3863A	Case, Shield, OSC	
128	UNIT-3867G	Printed Circuit, Power Supply	
129	WIR-SW3863	Brush, Pulse	
130	UNIT-3867F	Printed Circuit, Transistor	
131	RFU-512	Printed Circuit, IF MPX	
132	XFMT-578	Printed Circuit, Front End	
133	SILD-P3863	Bracket, Shield	
134	BUSH-SR3P4	Bush, AC Cord	
135	FUSE-0.3S	Fuse, 0.3A	
136	FUSE-1.0S	Fuse, 1.0A	
151	SC-SP-3863	Spacer, Sub-Chassis Operation	
152	SPR-3863A	Spring, Sub-Chassis	
153	WH-55	Wire Holder	
154	SPRING-PIN	Shaft, Spring(092)	
155	SC-P-A3863	Bracket, Sub-Chassis	
156	XCOUNT 3863	Counter	
157	ROL-SW3863	Switch, Pl Switch, Pulse	
158	SPR-3863W	Spring, Fast Forward Roller (085)	
159	SPR-3863K	Spring, Rewind Roller Lever (086)	
160	SPR-3863F	Spring, Pause Operation Lever (072)	
161	F-BANE	Spring, Fast Forward Lever (068)	
162	SPR-3863C	Spring, Fast Forward Lever (068)	
163	SPR-3863D	Spring, Rewind Operation Lever (069)	
164	SPR-3863H	Spring, Brake Operation Lever (074)	
165	SPR-3863E	Spring, Record Operation Lever (070)	
166	SPR-3863G	Spring, Eject Operation Lever (073)	
167	SPR-3863I	Spring, Stop Lever (079)	
168	ZETUEN BUSH	Bush, Insulator	
169	LEV-C-GOMU	Bush, Insulator	
170	SPR-3863M	Spring, Cassette Holder	

REF.NO.	PART NO.	DESCRIPTION	

RESISTORS

(Unless otherwise specified resistors are ¼W, Carbon type)

R1	1/4SU-82KK	82K ohm	
R2	1/4SU-82KK	82K ohm	
R3	1/4SU-470K	470 ohm	
R4	1/4SU-470K	470 ohm	
R5	1/4SU-100K	100 ohm	
R6	1/4SU-100K	100 ohm	
R7	1/4SU-56KK	56K ohm	
R8	1/4SU-56KK	56K ohm	
R9	1/4SU-220K	220 ohm	
R10	1/4SU-220K	220 ohm	
R11	1/4SU-100KK	100K ohm	
R12	1/4SU-100KK	100K ohm	
R13	1/4SU-330KK	330K ohm	
R14	1/4SU-330KK	330K ohm	
R15	1/4SU1.8KK	1.8K ohm	
R16	1/4SU1.8KK	1.8K ohm	
R17	1/4SU-10KK	10K ohm	
R18	1/4SU-10KK	10K ohm	
R19	1/4SU-8.2KK	8.2K ohm	
R20	1/4SU-8.2KK	8.2K ohm	
R21	1/4SU270KK	270K ohm	
R22	1/4SU270KK	270K ohm	
R23	1/4SU-47KK	47K ohm	
R24	1/4SU-47KK	47K ohm	
R25	1/4SU2.7KK	2.7K ohm	
R26	1/4SU2.7KK	2.7K ohm	
R27	1/4SU-12KK	12K ohm	
R28	1/4SU-12KK	12K ohm	
R29	1/4SU-47KK	47K ohm	
R30	1/4SU-47KK	47K ohm	
R31	1/4SU-18KK	18K ohm	
R32	1/4SU-18KK	18K ohm	
R33	1/4SA-15KK	15K ohm	
R34	1/4SA-15KK	15K ohm	
R35	1/4SU-150KK	150K ohm	
R36	1/4SU-150KK	150K ohm	
R37	1/4SU-470KK	470K ohm	
R38	1/4SU-470KK	470K ohm	
R39	1/4SU-820K	820 ohm	
R40	1/4SU-820K	820 ohm	
R41	1/4SU-150K	150 ohm	
R42	1/4SU-150K	150 ohm	
R43	1/4SU-220K	220 ohm	
R44	1/4SU-220K	220 ohm	
R45	1/4SU-180K	180 ohm	
R46	1/4SU-180K	180 ohm	
R47	1/4SU-10KK	10 ohm	
R48	1/4SU-10KK	10 ohm	
R101	1/2M-3.3MK	3.3Meg ohm, 1/2W, ±10%, Carbon	
R102	1/2M-3.3MK	3.3Meg ohm, 1/2W, ±10%, Carbon	
R103	1/4SU-68K	68 ohm	
R104	1/4SU-68K	68 ohm	
R105	1/4SU-22KK	22K ohm	
R106	1/4SU-22KK	22K ohm	
R107	1/4SU-10KK	10K ohm	
R108	1/4SU-10KK	10K ohm	
R109	1/4SU-82KK	82K ohm	
R110	1/4SU-82KK	82K ohm	
R111	1/4SU-15KK	15K ohm	
R112	1/4SU-15KK	15K ohm	
R113	1/4SU-56K	56 ohm	
R114	1/4SU-56K	56 ohm	
R115	1/4SU-1KK	1K ohm	
R116	1/4SU-1KK	1K ohm	

REF.NO.	PART NO,	DESCRIPTION	
R117	1/4SU-15KK	15K ohm	
R118	1/4SU-15KK	15K ohm	
R119	8V-3540	Semi-Variable, 100K ohm	
R120	8V-3540	Semi-Variable, 100K ohm	
R121	1/4SU-15KK	15K ohm	
R122	1/4SU-15KK	15K ohm	
R123	1/4SU-680KK	680K ohm	
R124	1/4SU-680KK	680K ohm	
R125	1/4SU-1.8KK	1.8K ohm	
R126	1/4SU-1.8KK	1.8K ohm	
R127	1/4SU-1.2KK	1.2K ohm	
R128	1/4SU-1.2KK	1.2K ohm	
R129	1/4SU-12KK	12K ohm	
R130	1/4SU-12KK	12K ohm	
R131	1/4SU-12KK	12K ohm	
R132	1/4SU-12KK	12K ohm	
R133	1/4SU-18KK	18K ohm	
R134	1/4SU-18KK	18K ohm	
R135	1/4SU-1KK	1K ohm	
R136	1/4SU-1KK	1K ohm	
R137	1/4SU-100K	100 ohm	
R138	1/4SU-100K	100 ohm	
R201	1/4SU-2.7KK	2.7K ohm	
R202	1/4SU-2.7KK	2.7K ohm	
R203	1/4SU-1.2KK	1.2K ohm	
R204	1/4SU-1.2KK	1.2K ohm	
R205	1/4SU-1.8KK	1.8K ohm	
R206	1/4SU-1.8KK	1.8K ohm	
R207	8V-3548	Volume control, 50K ohm, Monitor	
R208	8V-3526	Volume control, 50K ohm	
R209	8V-3478	Tone control, 50K ohm	
R210	8V-3478	Tone control, 50K ohm	
R211	8V-3478	Tone control, 50K ohm	
R212	8V-3478	Tone control, 50K ohm	
R213	8V-3524	Monitor Volume control, 100K ohm	
R214	8V-3524	Monitor Volume control, 100K ohm	
R301	1/4SU-820KK	820K ohm	
R302	1/4SU-820KK	820K ohm	
R303	1/4SU-10KK	10K ohm	
R304	1/4SU-10KK	10K ohm	
R305	1/4SU-82K	82 ohm	
R306	1/4SU-82K	82 ohm	
R307	8V-723	Semi-Variable, 50K ohm	
R308	8V-723	Semi-Variable, 50K ohm	
R309	1/4SU-22KK	22K ohm	
R310	1/4SU-22KK	22K ohm	
R311	1/4SU-68KK	68K ohm	
R312	1/4SU-68KK	68K ohm	
R313	1/4SU-820K	820 ohm	
R314	1/4SU-820K	820 ohm	
R315	1/4SU3.3KK	3.3K ohm	
R316	1/4SU3.3KK	3.3K ohm	
R317	8V-766	Semi-Variable, 1K ohm	
R318	8V-766	Semi-Variable, 1K ohm	
R319	1/4SU-68K	68 ohm	
R320	1/4SU-68K	68 ohm	
R321	1/4SU-330K	330 ohm	
R322	1/4SU-330K	330 ohm	
R323	1/2MR-0.5J	0.5 ohm, 1/2W, ±5%, Carbon	
R324	1/2MR-0.5J	0.5 ohm, 1/2W, ±5%, Carbon	
R325	1/2MR-0.5J	0.5 ohm, 1/2W, ±5%, Carbon	
R326	1/2MR-0.5J	0.5 ohm, 1/2W, ±5%, Carbon	
R327	1/4SU-3.3KK	3.3K ohm	
R328	1/4SU-3.3KK	3.3K ohm	
R329	1/2M-150K	150 ohm, 1/2W, ±10%, Carbon	
R330	1/2M-150K	150 ohm, 1/2W, ±10%, Carbon	

REF.NO.	PART NO.	DESCRIPTION	
R331	1/4SU-10K	10 ohm	
R332	1/4SU-10K	10 ohm	
R401	2PO-120K	120 ohm, 2W, ±10%, Oxide film	
R402	1/4SU-560K	560 ohm	
R403	1/4SU-120K	120 ohm	
R404	1/4SU-1.8KK	1.8K ohm	
R405	1/4SU-1.8KK	1.8K ohm	
R406	1/2M-33K	33 ohm, 1/2W, ±10%, Carbon	
R407	1/2M-33K	33 ohm, 1/2W, ±10%, Carbon	
R408	1/2MR-1J	1 ohm, 1/2W, ±5%, Carbon	
R409	8V-3472	Semi-Variable, 50K ohm	
R410	8V-3472	Semi-Variable, 50K ohm	
R411	1/4SU-4.7K	4.7 ohm	
R412	1/4SU-4.7K	4.7 ohm	
R501	1/4SU-470K	470 ohm	
R502	1/4SU-4.7KK	4.7K ohm	
R503	1/4SU-100K	100 ohm	
R504	1/4SU-120KK	120K ohm	
R505	1/4SU-120KK	120K ohm	
R506	1/4SU-8.2KK	8.2K ohm	
R507	1/4SU-18KK	18K ohm	
R508	1/4SU-3.9KK	3.9K ohm	
R509	1/4SU-3.9KK	3.9K ohm	
R601	1/2M-3.3MK	3.3Meg ohm, 1/2W, ±10%, Carbon	
R701	1/2M-470K	470 ohm, 1/2W, ±10%, Carbon	
R702	1/2M-470K	470 ohm, 1/2W, ±10%, Carbon	
R801	1/4SU-15KK	15K ohm	
R802	1/4SU-100KK	100K ohm	
R803	1/4SU-1MK	1Meg ohm	
R804	1/4SU-39J	39 ohm, 1/4W, ±5%, Carbon	
R805	1/4SU-33K	33 ohm	
R806	1/4SU-100K	100 ohm	
R807	1/4SU-2.7KK	2.7K ohm	
R808	1/4SU-22KK	22K ohm	
R809	1/4SU-18KK	18K ohm	
R810	1/4M-3.3MK	3.3 Meg ohm	
R811	1/4SU-150KK	150K ohm	
R812	1/4SU-220K	220 ohm	
R813	1/4SU-470KK	470K ohm	
R814	1/4SU-15KK	15K ohm	
R901	1/4SU-100KK	100K ohm	
R902	1/4SU-82K	82 ohm	
R903	1/4SU-680K	680 ohm	
R904	1/4SU-33K	33 ohm	
R905	1/4M-1KK	1K ohm	
R906	1/4SU-33K	33 ohm	
R907	1/4SU-47KK	47K ohm	
R908	1/4SU-680KK	680K ohm	
R909	1/4SU-1.2KK	1.2K ohm	
R910	1/4SU-1KK	1K ohm	
R911	1/4SU-1KK	1K ohm	
R912	1/4SU-22KK	22K ohm	
R913	1/4SU-10KK	10K ohm	
R914	1/4SU-100K	100 ohm	
R915	1/4SU-820KK	820K ohm	
R916	1/4SU-18KK	18K ohm	
R917	1/4SU-56KK	56K ohm	
R918	1/4SU-2.2KK	2.2K ohm	
R919	1/4M-820K	820 ohm	
R920	1/4M-39KK	39K ohm	
R921	1/4SU-82KK	82K ohm	
R922	1/4SU-18KK	18K ohm	
R923	1/4SU-82KK	22K ohm	
R924	1/4SU-68KK	68K ohm	
R925	1/4SU-220KK	220K ohm	
R926	1/4SU-560K	560 ohm	

REF.NO'	PART NO.	DESCRIPTION	
R927	1/4SU-100KK	100K ohm	
R928	1/4SU-180K	180 ohm	
R929	1/4SU-180K	180 ohm	
R930	1/4SU-33K	33 ohm	
R931	1/4SU-100KK	100K ohm	
R932	1/4SU-100KK	100K ohm	
R933	1/4SU-1KK	1K ohm	
R934	1/4SU-1KK	1K ohm	
R935	1/4SU-15KK	15K ohm	
R936	1/4SU-120KK	120K ohm	
R938	1/4SU-5.6KK	5.6K ohm	
R939	1/4SU-5.6KK	5.6K ohm	
R940	1/2M-680K	680 ohm, 1/2W, ±10%, Carbon	
R941	1/2M-150K	150 ohm, 1/2W, ±10%, Carbon	
R942	1/4SU-100K	100 ohm,	
R943	1/4M-150KK	150K ohm	
R944	1/4SU-6.8KK	6.8K ohm	
R945	1/4SU-6.8KK	6.8K ohm	
R946	8V-3498	Semi-Variable, 3K ohm	
R947	1/4SU-1.2MJ	1.2Meg ohm, 1/4W, ±5%, Carbon	
R948	1/4SU-100K	100K ohm	
R950	1/4SU-100KK	100K ohm	

CAPACITORS

C1	ML-5-226M	.0022MFD, 50V, ±20%, Mylar	
C2	ML-5-226M	.0022MFD, 50V, ±20%, Mylar	
C3	CU-1.6-102Q	10MFD, 16V, $\pm^{100}_{10}$%, Electrolytic	
C4	CU-1.6-102Q	10MFD, 16V, $\pm^{100}_{10}$%, Electrolytic	
C5	CU-5-103R	1MFD, 50V, $\pm^{150}_{10}$%, Electrolytic	
C6	CU-5-103R	1MFD, 50V, $\pm^{150}_{10}$%, Electrolytic	
C9	ML-5-106M	.001MFD, 50V, ±20%, Mylar	
C10	ML-5-106M	.001MFD, 50V, ±20%, Mylar	
C11	D-5-107K	100PF, 50V, ±10%, Discap	
C12	D-5-107K	100PF, 50V, ±10%, Discap	
C13	CU-06-472Q	47MFD, 6.3V, $\pm^{100}_{10}$%, Electrolytic	
C14	CU-06-472Q	47MFD, 6.3V, $\pm^{100}_{10}$%, Electrolytic	
C15	CU1.6-102Q	10MFD, 16V, $\pm^{100}_{10}$%, Electrolytic	
C16	CU1.6-102Q	10MFD, 16V, $\pm^{100}_{10}$%, Electrolytic	
C17	CU1.6-102Q	10MFD, 16V, $\pm^{100}_{10}$%, Electrolytic	
C18	CU1.6-102Q	10MFD, 16V, $\pm^{100}_{10}$%, Electrolytic	
C19	ML-5-155K	.015MFD, 50V, ±10%, Mylar	
C20	ML-5-155K	.015MFD, 50V, ±10%, Mylar	
C21	ML-5-395K	.039MFD, 50V, ±10%, Mylar	
C22	ML-5-395K	.039MFD, 50V, ±10%, Mylar	
C23	ML-5-225K	.022MFD, 50V, ±10%, Mylar	
C24	ML-5-225K	.022MFD, 50V, ±10%, Mylar	
C25	AD-1-224M	.22MFD, 10V, ±20%, Electrolytic	
C26	AD-1-224M	.22MFD, 10V, ±20%, Electrolytic	
C27	CU 1.6-472Q	47MFD, 16V, $\pm^{100}_{10}$%, Electrolytic	
C28	CU 1.6-472Q	47MFD, 16V, $\pm^{100}_{10}$%, Electrolytic	
C29	CU1.6-102Q	10MFD, 16V, $\pm^{100}_{10}$%, Electrolytic	
C30	CU1.6-102Q	10MFD, 16V, $\pm^{100}_{10}$%, Electrolytic	
C101	AD-1-474M	0.47MFD, 10V, ±20%, Electrolytic	

REF.NO.	PART NO'	DESCRIPTION	
C102	AD-1-474M	0.47MFD, 10V, ±20%, Electrolytic	
C103	CU1.6-472Q	47MFD, 16V, $\pm^{100}_{10}$%, Electrolytic	
C104	CU1.6-472Q	47MFD, 16V, $\pm^{100}_{10}$%, Electrolytic	
C105	AD-1-334M	0.3MFD, 12V, ±20%, Electrolytic	
C106	AD-1-334M	0.3MFD, 12V, ±20%, Electrolytic	
C107	CU1.6-102Q	10MFD, 16V, $\pm^{100}_{10}$%, Electrolytic	
C108	CU1.6-102Q	10MFD, 16V, $\pm^{100}_{10}$%, Electrolytic	
C109	CU1.6-102Q	10MFD, 16V, $\pm^{100}_{10}$%, Electrolytic	
C110	CU1.6-102Q	10MFD, 16V, $\pm^{100}_{10}$%, Electrolytic	
C111	CU1.6-102Q	10MFD, 16V, $\pm^{100}_{10}$%, Electrolytic	
C112	CU1.6-102Q	10MFD, 16V, $\pm^{100}_{10}$%, Electrolytic	
C113	ML-5-226K	.0022MFD, 50V, ±10%, Mylar	
C114	ML-5-226K	.0022MFD, 50V, ±10%, Mylar	
C115	ML-5-225K	.0022MFD, 50V, ±10%, Mylar	
C116	ML-5-225K	.022MFD, 50V, ±10%, Mylar	
C117	S-5-156J	1500PF, 50V, ±5%, Styrene	
C118	S-5-156J	1500PF, 50V, ±5%, Styrene	
C119	D-5-227K	220PF, 50V, ±10%, Discap	
C120	D-5-227K	220PF, 50V, ±10%, Discap	
C121	CU-06-472Q	47MFD, 6.3V, $\pm^{100}_{10}$%, Electrolytic	
C122	CU-06-472Q	47MFD, 6.3V, $\pm^{100}_{10}$%, Electrolytic	
C201	D-1.2-104M	.1MFD, 12V, ±20%, Discap	
C202	D-1.2-104M	.1MFD, 12V, ±20%, Discap	
C203	D-1.2-224M	.22MFD, 12V, ±20%, Discap	
C204	D-1.2-224M	.22MFD, 12V, ±20%, Discap	
C205	ML-5-105K	.01MFD, 50V, ±10%, Mylar	
C206	ML-5-105K	.01MFD, 50V, ±10%, Mylar	
C207	ML-5-335K	.033MFD, 50V, ±10%, Mylar	
C208	ML-5-335K	.033MFD, 50V, ±10%, Mylar	
C301	CU2.5-471Q	470MFD, 25V, $\pm^{100}_{10}$%, Electrolytic	
C302	CU2.5-471Q	470MFD, 25V, $\pm^{100}_{10}$%, Electrolytic	
C303	ML-5-275M	.027MFD, 50V, ±20%, Mylar	
C304	ML-5-275M	.027MFD, 50V, ±20%, Mylar	
C305	CU1.6-102Q	10MFD, 16V, $\pm^{100}_{10}$%, Electrolytic	
C306	CU1.6-102Q	10MFD, 16V, $\pm^{100}_{10}$%, Electrolytic	
C307	ML-5-226M	.0022MFD, 50V, ±20%, Mylar	
C308	ML-5-226M	.0022MFD, 50V, ±20%, Mylar	
C309	CU2.5-472Q	47MFD, 25V, $\pm^{100}_{10}$%, Electrolytic	
C310	CU2.5-472Q	47MFD, 25V, $\pm^{100}_{10}$%, Electrolytic	
C311	CU2.5-471Q	470MFD, 25V, $\pm^{100}_{10}$%, Electrolytic	
C312	CU2.5-471Q	470MFD, 25V, $\pm^{100}_{10}$%, Electrolytic	
C315	D-5-107K	100PF, 50V, ±10%, Discap	
C316	D-5-107K	100PF, 50V, ±10%, Discap	
C317	ML-5-336M	.0033MFD, 50V, ±20%, Mylar	
C318	ML-5-336M	.0033MFD, 50V, ±20%, Mylar	
C319	CU3.5-101Q	100MFD, 35V, $\pm^{100}_{10}$%, Electrolytic	
C401	ML-5-276M	.0027MFD, 50V, ±20%, Mylar	
C402	ML-5-395K	.039MFD, 50V, ±10%, Mylar	
C403	ML-5-395K	.039MFD, 50V, ±10%, Mylar	
C404	ML-5-395K	.039MFD, 50V, ±10%, Mylar	
C405	ML-5-686M	.0068MFD, 50V, ±20%, Mylar	

REF.NO.	PART NO.	DESCRIPTION	
C406	CU1.6-221Q	220MFD, 16V, $\pm^{100}_{10}$%, Electrolytic	
C407	D-5-337K	330PF, 50V, ±10%, Discap	
C408	D-5-337K	330PF, 50V, ±10%, Discap	
C501	CU3.5-101Q	100MFD, 35V, $\pm^{100}_{10}$%, Electrolytic	
C502	CU2.5-332Q	33MFD, 25V, $\pm^{100}_{10}$%, Electrolytic	
C503	CU2.5-102Q	10MFD, 25V, $\pm^{100}_{10}$%, Electrolytic	
C504	D-5-477K	470PFD, 50V, ±10%, Discap	
C601	CU3.5-100Q	1000MFD, 35V, $\pm^{100}_{10}$%, Electrolytic	
C602	CU3.5-100Q	1000MFD, 35V, $\pm^{100}_{10}$%, Electrolytic	
C603	D-5-205Z	.02MFD, 50V, $\pm^{80}_{20}$%, Discap	
C604	D-5-205Z	.02MFD, 50V, $\pm^{80}_{20}$%, Discap	
C605	OL-40-475M	.047MFD, 400V, ±10%, Oil	
C606	OL-40-475M	.047MFD, 400V, ±10%, Oil	
C607	MP-25-103K	.1MFD, 250V, ±10%, Metallized paper	
C801	D-5-157K	150PF, 50V, ±10%, Discap	
C802	D-5-158K	15PF, 50V, ±10%, Discap	
C803	D-2.5-205Z	.02MFD, 25V,	
C803	D-2.5-205Z	.02MFD, 25V, $\pm^{80}_{20}$%, Discap	
C804	D-2.5-205Z	.02MFD, 25V, $\pm^{80}_{20}$%, Discap	
C805	D-2.5-188K	18PF, 25V, $\pm^{80}_{20}$%, Discap	
C806	D-2.5-205Z	.02MFD, 25V, $\pm^{80}_{20}$%, Discap	
C807	D-5-509Z	5PF, 50V, ±0.5PF, Discap	
C808	D-5-478K	47PF, 50V, ±10%, Discap	
C809	D-5-337K	330PF, 50V, ±10%, Discap	
C810	D-5-209C	2PF, 50V, ±0.25PF, Discap	
C811	D-5-105P	.01MFD, 50V, $\pm^{100}_{0}$%, Discap	
C812	D-5-509C	5PF, 50V, ±0.25 PF, Discap	
C813	DSH-5-108K	10PF, 50V, ±10%, Discap	
C814	D-2.5-205Z	.02MFD, 25V, $\pm^{80}_{20}$%, Discap	
C815	D-2.5-205Z	.02MFD, 25V, $\pm^{80}_{20}$%, Discap	
C816	D-5-187J	180PF, 50V, ±5%, Discap	
C817	D-5-157K	150PF, 50V, ±10%, Discap	
C901	D-5-105P	.01MFD, 50V, $\pm^{100}_{0}$%, Discap	
C902	ML-5-225M	.022MFD, 50V, ±20%, Mylar	
C903	D-5-337K	330PF, 50V, ±10%, Discap	
C904	CU-5-103R	1MFD, 25V, $\pm^{150}_{10}$%, Electrolytic	
C905	D-5-206P	.002MFD, 50V, $\pm^{100}_{0}$%, Discap	
C906	D-2.5-405Z	.04MFD, 25V, $\pm^{80}_{20}$%, Discap	
C907	D-2.5-405Z	.04MFD, 25V, $\pm^{80}_{20}$%, Discap	
C908	D-5-109C	1PF, 50V, ±0.25PF, Discap	
C909	D-5-709D	7PF, 50V, ±0.5PF, Discap	
C910	D-5-206P	.002PF, 50V, $\pm^{100}_{0}$%, Discap	
C911	D-5-159C	1.5PF, 50V, ±0.25PF, Discap	
C912	D-2.5-405Z	.04MFD, 25V, $\pm^{80}_{20}$%, Discap	
C913	D-2.5-405Z	.04MFD, 25V, $\pm^{80}_{20}$%, Discap	
C914	D-2.5-405Z	.04MFD, 25V, $\pm^{80}_{20}$%, Discap	

REF.NO.	PART NO.	DESCRIPTION	
C915	D-5-159C	1.5PF, 50V, ±0.25PF, Discap	
C916	D-5-337K	330PF, 50V, ±10%, Discap	
C917	D-5-337K	330PF, 50V, ±10%, Discap	
C918	CU-2.5-333R	3.3MFD, 25V, $\pm^{150}_{10}$%, Electrolytic	
C919	CU2.5-473R	4.7MFD, 25V, $\pm^{150}_{10}$%, Electrolytic	
C920	D-5-567K	560PF, 50V, ±10%, Discap	
C921	D-2.5-205Z	.02MFD, 25V, $\pm^{80}_{20}$%, Discap	
C922	D-2.5-205Z	.02MFD, 25V, $\pm^{80}_{20}$%, Discap	
C923	D-5-567K	560PF, 50V, ±10%, Discap	
C924	ML-5-155M	.015MFD, 50V, ±20%, Mylar	
C925	ML-5-105M	.01MFD, 50V, ±20%, Mylar	
C926	D-2.5-405Z	.04MFD, 25V, $\pm^{80}_{20}$%, Discap	
C927	D-1.2-154M	.15MFD, 12V, ±20%, Discap	
C928	D-5-157K	150PF, 50V, ±10%, Discap	
C929	D-2.5-405Z	.04MFD, 25V, $\pm^{80}_{20}$%, Discap	
C930	D-2.5-405Z	.04MFD, 25V, $\pm^{80}_{20}$%, Discap	
C931	D-2.5-405Z	.04MFD, 25V, $\pm^{80}_{20}$%, Discap	
C932	ML-5-826M	.0082MFD, 50V, ±20%, Mylar	
C933	ML-5-826M	.0082MFD, 50V, ±20%, Mylar	
C934	D-5-128K	12PF, 50V, ±10%, Discap	
C935	D-5-108K	10PF, 50V, ±10%, Discap	
C936	CU1.6-473R	4.7MFD, 16V, $\pm^{150}_{10}$%, Electrolytic	
C937	ML-5-225K	.022MFD, 50V, ±10%, Mylar	
C938	D-1.2-224M	.22MFD, 12V, ±20%, Discap	
C939	CU1.6-102Q	10MFD, 16V, $\pm^{100}_{10}$%, Electrolytic	
C940	D-5-405Z	.04MFD, 50V, $\pm^{80}_{20}$%, Discap	
C941	CU2.5-100Q	1000MFD, 25V, $\pm^{100}_{10}$%, Electrolytic	
C942	CU2.5-471Q	470MFD, 25V, $\pm^{100}_{10}$%, Electrolytic	
C943	CU1.6-471Q	470MFD, 16V, $\pm^{100}_{10}$%, Electrolytic	
C944	CU1.6-102Q	10MFD, 16V, $\pm^{100}_{10}$%, Electrolytic	

CAPACITORS

VC801, VC802 VC803, VC804 VC805, TC801 TC802, TC804 TC805	XVC-179	Variable Tuning Gang with Trimmers	
TC803	TO-859	Trimmer, FM local OSC	

PACKAGED CIRCUIT

M901	PRC-413	Capristor	
M902	PRC-413	Capristor	

REF.NO.	PART NO.	DESCRIPTION	

TRANSISTORS

Q1, Q2	2SC-458LGC	1st, Audio Amp	
Q3, Q4	2SC-458LGC	2nd, Audio Amp	
Q101, Q102	2SC-458B	3rd, Audio Amp	
Q103, Q104	2SC-458B	4th, Audio Amp	
Q105, Q106	2SC-458B	Meter, Amp	
Q301, Q302	2SC-372Y	Pre-Driver Amp	
Q303, Q304	2SC-372O	Thermo Compensation	
Q305, Q306	2SC-509Y	Driver Amp	
Q307, Q308	2SC-1162WT	Power Amp	
Q309, Q310	2SA-715WT	Power Amp	
Q401, Q402	2SC-735Y	Bias OSC	
Q501	2SC-372Y	Detector	
Q502	2SA-509Y	Switching	
Q801	3SK-30B	FM RF	
Q802	2SC-535B	FM Converter	
Q901	2SC-460B	FM 1st, AM 1st IF Amp	
Q902	2SC-460B	FM 2nd, AM 2nd IF Amp	
Q903	2SC-460C	FM 3rd, IF Amp	
Q904	2SC-454B	AM Converter	

DIODES

D501	1S-155V	Reverse Current Prevention	
D502	1S-1941	Surge Prevention	
D601, D602	SI-RECT-77	Rectifier	
D801	1S-2139C	FM AFC	
D901	1N-60	FM AGC	
D902	1N-60	FM AGC	
D903	1N-60	FM Limitter	
D904	1N-60	FM Limitter	
D905	1N-60P	FM Detector	
D906	1N-60P	FM Detector	
D907	1N-60	AM AGC	
D908	1N-60	AM Detector	
D909	1S-1941	Rectifier	
D910	HZ-9CGR	Voltage Regulator	

TRANSFORMERS

T601	5T-922SEV	Power, SEV	
T801	4IF-815	FM 1st IFT	
T901	4IF-835	FM 2nd IFT	
T902	4IF-874	FM 3rd IFT	
T903	4IF-781	FM Discriminator	
T904	4IF-806	AM 1st IFT	
T905	7IF-872	AM 2nd IFT	
T906	7IF-899	AM 3rd IFT	

REF.NO.	PART NO.	DESCRIPTION	

COILS

L101, L102	4L-963	Bias Trap	
L401	4L-404B	Bias OSC	
L501	XPLUG-3863	Electromagnet	
L801-a.b	4L-178A	FM Antenna	
L802-b	4L-544C	FM RF	
L802-a	4L-542C	FM RF	
L801-c	4L-556C	FM Antenna	
L803	7L-947	10.7MHz Trap	
L804	4L-368B	FM OSC	
L805	4L-206A	AM Antenna	
L806	CL-100M	Choke	
L901	CL-108M	Choke	
L902	7L-054B	AM OSC	
L903	4L-004	FM MPX	
L904	4L-002	FM MPX	
L905	4L-998	FM MPX	

IC (Integrated Circuit)

IC-901	4IC-405	FM MPX	

SWITCHES

SW1	13S-408	Record/Playback	
SW2	XOS-93	Power	
SW3	13S-840UL	Cassette Loading	
SW4	X13S-424	R.I.F	
SW5	13S-860	Transport Power A	
SW6	13S-858	Transport Power B	
SW7	13S-862	Pulse	
SW8	13S-132	Function Selector	

PILOT LAMPS

PL-601, PL-602 PL-603, PL-604	PL-2511UL	Dial Input Source	
PL-605, PL-606	PL-504	Level Meter Illumination	
PL-901	PL-2509	FM STEREO Indicator	

SOCKETS

SO601 SO602	SO-219	Pilot Lamp	
SO603	SO-037	Voltage Selector	
SO701	SO-011	Line In	
SO702	SO-011	Phono	
SO703	SO-011	REC/PB	
SO704	SO-035	Speaker, LEFT	
SO705	SO-035	Speaker, RIGHT	
SO901	SO-039	FM ANT	
SO902	SO-041	AM ANT	

REF.NO.	PART NO.	DESCRIPTION	

JACKS

J701	J-3919	Microphone	
J702	J-3919	Microphone	
J703	J-3915	Headphone	

METERS

ME101, ME102	METER-3725	Record Level	

TERMINAL BOARD

TB801	T-311	FM ANT Terminal	

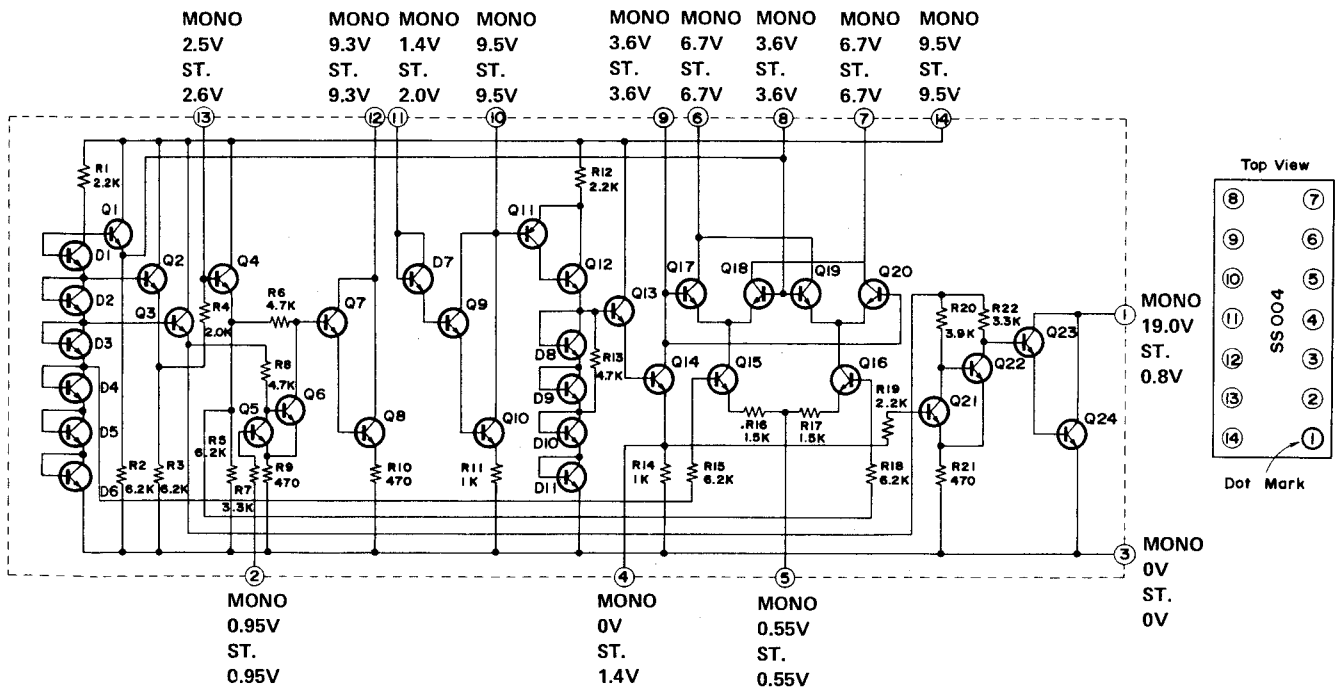
REF.NO.	PART NO.	DESCRIPTION	

MISCELLANEOUS

SP701	CS-TAPE	Cassette Tape	
SP702	MIC-3863	Microphone (MDL-128)	
SP703	ACC-305		
SP704	PG-439		
	ACC-325SEV		
	ACC-297		
	PG-449		
	ANT-WIRE37		

CP-108H (Speaker)

	X2CAB3949B	Cabinet	
	16P–698	Speaker, Woofer	
	4T-258	Speaker, Tweeter	
	X3ND	Nut, Speaker Retaining	
	NP-3-153M	Capacitor, 1.5MFD, 30V, ±20%	
	OP-CORD061	Cord	
	U-BUTA3949	Back Panel	



EQUIVALENT CIRCUIT OF INTEGRATED CIRCUIT